California MEDICINE

NOVEMBER 1954

OFFICIAL JOURNAL
OF THE CALIFORNIA MEDICAL ASSOCIATION

VOLUME 81 NUMBER 5

PHOTOGRAPH BY CHARLES KERLEE

Gives "remarkable increase in strength, vigor"[1]...

REDISOL®

CRYSTALLINE VITAMIN B12

In "pernicious anemia or tropical sprue in relapse," not even blood transfusions give "the remarkable increase in strength, vigor, and appetite..."[1] induced by large amounts of vitamin B_{12}.

Vitamin B_{12}—REDISOL—has hemopoietic activity of liver[2]; improves neurologic symptoms—no evidence of toxicity;[2] makes the patient "happy to work again."[1] Effective orally, as well as parenterally.

REDISOL is valuable also in nutritional macrocytic anemia; relieves pain in trigeminal neuralgia.

Quick Information: Dosage forms for a variety of indications. *Tablets,* 25 and 50 *mcg.; Injectable,* 30, 100 and 1,000 *mcg.* per cc.; *Elixir,* 5 *mcg.* per 5 cc.

References: 1. J.A.M.A. 153:185, 1953. **2.** N.N.R. 1953, p. 486.

California MEDICINE
OWNED AND PUBLISHED BY THE CALIFORNIA MEDICAL ASSOCIATION
450 SUTTER, SAN FRANCISCO 8, CALIFORNIA • TELEPHONE DOUGLAS 2-0062
Address editorial communications to Dwight L. Wilbur, M.D., and business communications to John Hunton

Advertisements—CALIFORNIA MEDICINE is published on the seventh of each month. Advertising copy must be received not later than the tenth of the month preceding issue. Advertising rates will be sent on request. Acceptance of advertising is contingent upon approval by the Advertising Committee.

Advertising Committee: Members—Robertson Ward, M.D., Chairman, San Francisco; W. Dayton Clark, M.D., San Francisco; Allen T. Hinman, M.D., San Francisco; Eugene S. Hopp, M.D., San Francisco; William C. Mumler, M.D., Los Angeles. *Technical Advisors:* Hamilton H. Anderson, M.D., San Francisco; Clinton H. Thienes, M.D., Los Angeles; R. W. Weilerstein, M.D., San Francisco.

ADVERTISING MANAGER . . . . . HERBERT A. DADY

Subscription prices, $6 ($7 for foreign countries); single copies, 60 cents.

Volumes begin with the first of January and the first of July. Subscriptions may commence at any time.

Change of Address—Requests for change of address should give both the old and new address, and should be made by county secretaries or by the member concerned.

Contributions of Scientific and Original Articles

Responsibility for Statements and Conclusions in Original Articles—Authors are responsible for all statements, conclusions and methods of presenting their subjects. These may or may not be in harmony with the views of the editorial staff. It is aimed to permit authors to have as wide latitude as the general policy of the Journal and the demands on its space may permit. The right to reduce, revise or reject any manuscript is always reserved.

Exclusive Publication—Articles are accepted for publication on condition that they are contributed solely to this Journal. Ordinarily contributors will be notified within 60 days if a manuscript is accepted for publication. Every effort will be made to return unused manuscripts.

Length of Article—Ordinarily articles should not exceed 3,000 words (approximately 3 printed pages). Under exceptional circumstances only will articles of over 4,000 words be published.

Manuscripts—Manuscripts should be typewritten, double spaced, and the original and a carbon copy submitted.

Illustrations—Ordinarily publication of 2 or 3 illustrations accompanying an article will be paid for by CALIFORNIA MEDICINE. Any number beyond this will have to be paid for by the author.

References—Should conform to the following order: name of author, title of article, name of periodical, with volume, page, month, day of the month if weekly, and year—i.e.: Lee, G. S.: The heart rhythm following therapy with digitalis, Arch. Int. Med., 44:554, Dec. 1942. They should be listed in alphabetical order and numbered in sequence.

Reprints—Reprints must be paid for by the author at established standard rates.

Contributions of "Letters to the Editor," News and Notes, and Antispasmodics

The Editorial Board will be glad to receive and consider for publication letters containing information of general interest to physicians throughout the State or presenting constructive criticisms on controversial issues of the day. Also News and Notes items regarding the affairs and activities of hospitals, individuals, communities and local medical societies and groups throughout the State, as well as material in the lighter vein.

"Entered as second-class matter at the post office at San Francisco, under the Act of March 3, 1879." Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized August 10, 1918.

California Physicians' Service

Headquarters office of the California Physicians' Service is located at 450 Mission Street, San Francisco 5. Telephone SUtter 1-4633. Los Angeles office located at 431 South Fairfax, Los Angeles 54. Telephone WEbster 1-6311.

BOARD OF TRUSTEES

Francis T. Hodges, M.D. . . . . President
Frank A. MacDonald, M.D. . . First Vice-President
C. Glenn Curtis, M.D. . . Second Vice-President
Philip N. Baxter, M.D. . . . . Secretary
Merlin L. Newkirk, M.D. . . . . Treasurer
Leon O. Desimone, M.D. . Asst. Secretary-Treasurer

Edwin L. Bruck, M.D.
Thomas N. Foster, M.D.
Mr. Thomas Hadfield
*Ivan C. Heron, M.D.
Mr. Carey S. Hill
Mr. Robert A. Hornby
*A. A. Morrison, M.D.
Rt. Rev. Msgr. Thomas J. O'Dwyer
J. Norman O'Neill, M.D.
T. Eric Reynolds, M.D.
Mr. Ransom M. Cook
John F. Wanless, M.D.

*Reappointed to the Board of Trustees by the Council of C.M.A. for a term of one year.

Officers of the California Medical Association

General Officers

President—Arlo A. Morrison, 34 North Ash Street, Ventura. Miller 3-9933.
President-Elect—Sidney J. Shipman, 490 Post Street, San Francisco 2. GArfield 1-2127.
Speaker of House of Delegates—Donald A. Charnock, 2010 Wilshire Boulevard, Los Angeles 57. DUnkirk 8-9555.
Vice-Speaker of House of Delegates—Wilbur Bailey, 2009 Wilshire Boulevard, Los Angeles 57. DUnkirk 2-2161.

Chairman of the Council—Donald D. Lum, 2225 Central Avenue, Alameda, LAkehurst 2-1911.

Chairman of Executive Committee—Ivan C. Heron, 490 Post Street, San Francisco 2. SUtter 1-4720.

Secretary—Albert C. Daniels, 490 Post Street, San Francisco 2. EXbrook 2-1238.

Editor—Dwight L. Wilbur, 655 Sutter Street, San Francisco 2. ORdway 3-4080.

Executive Secretary—John Hunton, 450 Sutter Street, Room 2000, San Francisco 8. DOuglas 2-0062.

General Counsel—Peart, Baraty and Hassard, 111 Sutter Street, Room 1800, San Francisco 4. SUtter 1-0861.

Councilors

District Councilors

FIRST DISTRICT—Francis E. West, (1955), 2290 Sixth Avenue, San Diego 1. San Diego County. BElmont 2-0144.

SECOND DISTRICT — Omer W. Wheeler, (1956), 6876 Magnolia Avenue, Riverside. Imperial, Inyo, Mono, Orange, Riverside and San Bernardino Counties. Riverside 6644.

THIRD DISTRICT—H. Clifford Loos (1957), 947 West Eighth Street, Los Angeles 17. Los Angeles County. TUcker 1381.

FOURTH DISTRICT — J. Philip Sampson (1955), 2200 Santa Monica Boulevard, Santa Monica. Los Angeles County. EXbrook 5-3215.

FIFTH DISTRICT—Robert O. Pearman (1956), 1235 Morro Street, San Luis Obispo. San Luis Obispo, Santa Barbara and Ventura Counties. San Luis Obispo 2822.

SIXTH DISTRICT—Henry A. Randel (1957), 1304 Olive Street, Fresno. Calaveras, Fresno, Kern, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tulare and Tuolumne Counties. Fresno 3-2113.

SEVENTH DISTRICT — Hartzell H. Ray (1955), 23 Baldwin Avenue, San Mateo. Monterey, San Benito, San Mateo, Santa Clara and Santa Cruz Counties. Diamond 3-3641.

EIGHTH DISTRICT — Samuel R. Sherman (1957), 2255 Van Ness Avenue, San Francisco 9. San Francisco County. PRospect 5-5835.

NINTH DISTRICT—Donald D. Lum (1957), 225 Central Avenue, Alameda. Alameda and Contra Costa Counties. LAkehurst 2-1911.

TENTH DISTRICT—Warren L. Bostick (1955), 1 Hacienda Avenue, Mill Valley. Del Norte, Humboldt, Lake, Marin, Mendocino, Napa, Solano, Sonoma Counties. Glenwood 3-3266.

ELEVENTH DISTRICT—Ralph C. Teall (1956), 2626 L Street, Sacramento 16. Alpine, Amador, Butte, Colusa, Eldorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Yolo and Yuba Counties. HUdson 4-1851.

Councilors-at-Large

Benjamin Frees (1955), 629 South Westlake Avenue, Los Angeles 57. DUnkirk 8-9561.
Hollis L. Carey (1955), 567 Kentucky Street, Gridley. Gridley 5688.
Arthur A. Kirchner (1956), 2007 Wilshire Blvd., Los Angeles 57. DUnkirk 8-3311.
T. Eric Reynolds (1956), 431 Thirtieth Street, Oakland 9. TWinoaks 3-0422.
Arthur E. Varden (1957), 780 E. Gilbert St., San Bernardino. San Bernardino 7224.
Ivan C. Heron (1957), 490 Post Street, San Francisco 2. SUtter 1-4720.

Standing Committees

Executive Committee

The President, the President-Elect, the Speaker of the House of Delegates, the Chairman of the Council, the Chairman of the Auditing Committee, the Secretary-Treasurer (ex-officio), and the Editor (ex-officio).

Auditing Committee*

Ivan C. Heron (Chairman)	San Francisco	1955
T. Eric Reynolds	Oakland	1955
Samuel R. Sherman	San Francisco	1955

Committee on Associated Societies and Technical Groups

James F. Regan	Los Angeles	1955
H. Gordon MacLean (Chairman)	Oakland	1956
Charles E. Grayson	Sacramento	1957

Committee on History and Obituaries

John V. Barrow	Los Angeles	1955
J. Roy Jones	Sacramento	
J. Marion Read (Chairman)	San Francisco	1957
Dwight L. Wilbur (Editor)	Ex-officio	
Albert C. Daniels (Secretary)	Ex-officio	

Committee on Hospitals, Dispensaries and Clinics

Howard C. Miles	Salinas	1955
Karl Schaupp, Jr.	San Francisco	1956
Jay J. Crane (Chairman)	Los Angeles	1957

Committee on Industrial Practice

Packard Thurber, Sr. (Chairman)	Los Angeles	1955
Harold Downing	Fresno	1956
John E. Kirkpatrick	San Francisco	1957

Committee on Medical Economics

Ray Ouer	San Diego	1955
Robert Patrick	Taft	1956
L. H. Fraser (Chairman)	Richmond	1957

Committee on Medical Education and Medical Institutions

Walter E. Macpherson (Chairman)	Los Angeles	1955
Paul Foster	Los Angeles	1956
Loren R. Chandler	San Francisco	1957

Committee on Military Affairs and Civil Defense

Frank F. Schade	Los Angeles	1955
William L. Bender	San Francisco	1956
Justin J. Stein (Chairman)	Los Angeles	1957
John C. Ruddock (Consultant)	Los Angeles	

*Members appointed each year by the Chairman of the Council.

Committee on Postgraduate Activities

Herbert W. Jenkins	Sacramento	1955
Edward C. Rosenow (Chairman)	Pasadena	1956
John E. Young	Fresno	1957

Committee on Public Policy and Legislation

James C. Doyle	Beverly Hills	1955
Dwight H. Murray (Chairman)	Napa	1956
Dan O. Kilroy	Sacramento	1957
Arlo A. Morrison (President)	Ex-officio	
Sidney J. Shipman (President-Elect)	Ex-officio	

Legislative Advisory Committee

G. Glenn Curtis	Brea
J. Lafe Ludwig	Los Angeles
Frank A. MacDonald	Sacramento
H. R. Madeley	Vallejo
Wilson Stegeman	Santa Rosa

Committee on Scientific Work

George H. Houck	Palo Alto	1955
Robert L. Dennis	San Jose	1956
George C. Griffith	Los Angeles	1957
Albert C. Daniels (Chairman)	Ex-officio	
Roger O. Egeberg (Secretary on Medicine)	Ex-officio	
Lyman A. Brewer III (Secretary on Surgery)	Ex-officio	

Committee on Public Relations

The Committee on Public Relations consists of the chairmen of the following standing committees and certain general officers of the Association, all serving ex-officio.

Dwight H. Murray....Chairman, Com. on Public Policy and Legislation
L. H. Fraser....Chairman, Committee on Medical Economics
H. Gordon MacLean, Chairman, Committee on Associated Societies and Technical Groups
Arlo A. Morrison....President
Sidney J. Shipman....President-Elect
J. Lafe Ludwig....Los Angeles
Frank A. MacDonald....Sacramento

Cancer Commission

Ian G. Macdonald (Chairman)	Los Angeles	1955
L. Henry Garland (Secretary)	San Francisco	1955
Justin J. Stein	Los Angeles	1955
Robert A. Scarborough	San Francisco	1956
Erle Henriksen	Los Angeles	1956
Albert C. Daniels	San Francisco	1956
John W. Cline	San Francisco	1957
David A. Wood (Vice-Chairman)	San Francisco	1957
John M. Kenney	Santa Rosa	1957

Physicians' Benevolence Committee

Elizabeth Mason Hohl	Los Angeles	1955
Ford P. Cady	Los Angeles	1956
Axcel E. Anderson (Chairman)	Fresno	1957

in the treatment of Hypertension

Prolonged effect of mannitol hexanitrate

lowers pressure for 4 to 6 hours

New and Nonofficial Remedies: A.M.A. Council on Pharmacy and Chemistry, J. B. Lippincott, p. 243, 1953.

Marked diuretic action of theophylline

facilitates sodium excretion

Med. Times *81*:266 (Apr.) 1953.

Phenobarbital for relaxation without hypnosis

most useful for promoting daytime relaxation

J.A.M.A. *147*:1311 (Dec.) 1951.

Ascorbic acid + rutin for capillary protection

help to maintain capillary integrity

Delaware State M. J. *22*:283 (Oct.) 1950.

Semhyten®

BRINGS THE PRESSURE DOWN SLOWLY  **SAFELY**

Complete Medication for the Hypertensive

Each Semhyten Capsule contains:	Phenobarbital..¼ gr. (15 mg.)
Mannitol Hexanitrate....½ gr. (30 mg.)	Rutin .....10 mg.
Theophylline .....1½ gr. (0.1 Gm.)	Ascorbic Acid .....15 mg.

Supplied: In bottles of 100, 500 and 1000 pink-top capsules.

The S. E. MASSENGILL Company • Bristol, Tennessee

OFFICERS OF SCIENTIFIC SECTIONS CALIFORNIA MEDICAL ASSOCIATION

Members who contemplate presentation of scientific papers should promptly address the secretary of the proper section, as per addresses which follow. Correspondence concerning scientific exhibits and medical and surgical films should be addressed to the Chairman of the Committee on Scientific Work.

Allergy

Chairman, Norman Shure, 6317 Wilshire Blvd., Los Angeles 48.

Vice-Chairman, L. J. Courtright, 490 Post Street, San Francisco 2.

Secretary, Ben C. Eisenberg, 2680 Saturn Ave., Huntington Park.

Anesthesiology

Chairman, Marshall L. Skaggs, 807 30th St., Sacramento.

Secretary, John P. Howard, 2558 4th Ave., San Diego 3.

Assistant Secretary, Robert W. Churchill, 1180 Montgomery Drive, Santa Rosa.

Dermatology and Syphilology

Chairman, Edward A. Levin, 450 Sutter Street, San Francisco 8.

Secretary, R. Raymond Allington, 3115 Webster Street, Oakland 9.

Assistant Secretary, Anker K. Jensen, 1052 West Sixth Street, Los Angeles 17.

Eye, Ear, Nose and Throat

Chairman, Francis A. Sooy, 490 Post St., San Francisco 2.

Secretary, Robert N. Shaffer, 490 Post St., San Francisco 2.

Assistant Secretary, Robert W. Godwin, 117 E. Eighth Street, Long Beach.

General Medicine

Chairman, Edgar Wayburn, 490 Post Street, San Francisco 2.

Secretary, Roger O. Egeberg, Wadsworth General Hospital, Los Angeles 25.

Assistant Secretary, Harold C. Sox, 300 Homer Avenue, Palo Alto.

General Practice

Chairman, Joseph W. Telford, 3255 Fourth Ave., San Diego 3.

Secretary, Stanley R. Parkinson, 326 G Street, Marysville.

Assistant Secretary, T. Jackson Laughlin, 10910 Riverside Drive, North Hollywood.

General Surgery

Chairman, William Brock, 2633 Pacific Ave., Stockton 4.

Secretary, Lyman A. Brewer III, 2010 Wilshire Blvd., Los Angeles 57.

Assistant Secretary, Orville F. Grimes, U. C. Hospital, San Francisco 22.

Industrial Medicine and Surgery

Chairman, Dan O. Kilroy, 3300 Third Ave., Sacramento 17.

Secretary, Verne G. Ghormley, 3032 Tulare Street, Fresno.

Assistant Secretary, Homer S. Elmquist, 629 S. Westlake, Los Angeles 57.

Obstetrics and Gynecology

Chairman, Harold K. Marshall, 229 N. Central Ave., Glendale 3.

Vice-Chairman, Charles T. Hayden, 411 30th St., Oakland 9.

Secretary, George Judd, 2010 Wilshire Blvd., Los Angeles 57.

Pathology and Bacteriology

Chairman, Paul Michael, 450 30th Street, Oakland 9.

Secretary, Orlyn B. Pratt, 312 North Boyle Ave., Los Angeles 33.

Assistant Secretary, Justin Dorgeloh, 378 30th St., Oakland 9.

Pediatrics

Chairman, Gordon F. Williams, Stanford Convalescent Home, Stanford.

Secretary, Milo B. Brooks, 1015 Gayley Avenue, Los Angeles 24.

Assistant Secretary, Moses Grossman, University of California, Medical Center, San Francisco 22.

Psychiatry and Neurology

Chairman, George N. Thompson, 2010 Wilshire Blvd., Los Angeles 57.

Secretary, Knox H. Finley, 450 Sutter Street, San Francisco 8.

Assistant Secretary, R. Gordon T. Millar, 490 Post Street, San Francisco 2.

Public Health

Chairman, L. S. Goerke, U.C.L.A. School of Medicine, Los Angeles 24.

Secretary, E. M. Bingham, 130 S. American Street, Stockton.

Radiology

Chairman, H. R. Morris, 1583 D Street, San Bernardino.

Secretary, Merrell A. Sisson, 450 Sutter Street, San Francisco 8.

Assistant Secretary, Austin R. Wilson, 540 N. Central Ave., Glendale 3.

Urology

Chairman, Thomas I. Buckley, 431 30th St., Oakland 9.

Secretary, Wilson Stegeman, 1166 Montgomery Drive, Santa Rosa.

Assistant Secretary, Edmund Crowley, 1930 Wilshire Blvd., Los Angeles 57.

California Medical Association Delegates and Alternates to the American Medical Association

DELEGATES		ALTERNATES
H. Gordon MacLean, Oakland	(1953-1954)	Leopold H. Fraser, Richmond
E. Vincent Askey, Los Angeles	(1953-1954)	H. Clifford Loos, Los Angeles
Dwight L. Wilbur, San Francisco	(1953-1954)	J. Frank Doughty, Tracy
Donald Cass, Los Angeles	(1953-1954)	J. Norman O'Neill, Los Angeles
J. Lafe Ludwig, Los Angeles	(1953-1954)	H. Milton Van Dyke, Long Beach
R. Stanley Kneeshaw, San Jose	(1953-1954)	Burt Davis, Palo Alto
Robertson Ward, San Francisco	(1954-1955)	Henry Gibbons III, San Francisco
Sam J. McClendon, San Diego	(1954-1955)	A. E. Moore, San Diego
Eugene F. Hoffman, Los Angeles	(1954-1955)	Frederic S. Ewens, Manhattan Beach
John W. Green, Vallejo	(1954-1955)	Orris R. Myers, Apple Valley
L. A. Alesen, Los Angeles	(1954-1955)	J. B. Price, Santa Ana
Frank A. MacDonald, Sacramento	(1954-1955)	Henry A. Randel, Fresno
Paul H. Foster, Los Angeles	(1954-1955)	Arthur A. Kirchner, Los Angeles

Blood Bank Commission

John R. Upton, Chairman.....San Francisco
Charles Bates .....San Francisco
DeWitt K. Burnham.....San Francisco
Gurth Carpenter.....Beverly Hills
E. R. Evans.....Pasadena
R. G. Frey.....Red Bluff
John W. Green.....Vallejo
Donald Harrington .....Stockton
Andrew Henderson .....Sacramento
Malcolm Merrill .....San Francisco
Herbert B. Messinger.....Napa
C. D. Newel.....Fresno
L. N. Osell.....Bakersfield
Thomas O'Connell.....San Diego
George Paap .....Long Beach
Gerald K. Ridge.....Ventura
David Singman .....Berkeley
Leonard Taylor.....San Bernardino
Sidney Tepper.....El Centro
Owen Thomas.....Santa Rosa
George B. Watson.....Eureka

Rural Health Committee

Henry A. Randel, Chairman.....Fresno
William P. Aiken.....Palm Springs
Carroll B. Andrews .....Sonoma
Dale E. Barber.....Napa
Lloyd C. Beardsley.....Verdugo City
Ernest Brock .....Imperial
Bradley C. Brownson.....San Mateo
Henry R. Eagle.....Redding
Franklin K. Helbling.....Ventura
Howard F. Nachtman .....Modesto
Robb Smith .....Orange Cove
J. Frank Doughty, Ex-Officio Member....Tracy

Medical Services Commission

Hollis L. Carey, Chairman.....Gridley
H. Gordon MacLean, Vice-Chairman..Oakland
Henry Gibbons, III, Secretary.....San Francisco
Francis J. Cox.....San Francisco
Paul D. Foster.....Los Angeles
James B. Irwin.....San Diego
E. R. Lambertson.....Los Angeles
E. Eric Larson.....Los Angeles
Robert A. Patrick.....Taft
Emmet L. Rixford, Jr.....San Francisco
Robert M. Shelton.....Pasadena
Ralph C. Teall.....Sacramento

Other Organizations and Medical Schools

Board of Medical Examiners of the State of California

San Francisco—507 Polk Street, Room 306, (2).
Los Angeles—145 South Spring Street (12).
Sacramento—Business and Professional Building, 1020 N Street, Room 536 (14).
Secretary, Louis E. Jones, M.D., 1020 N Street, Room 536, Sacramento 14.

The Public Health League of California

Executive Secretary, Ben H. Read, San Francisco office, 530 Powell Street (2), SUtter 1-8470. Los Angeles office, 510 South Spring Street (13), MAdison 6-6151.

Department of Public Health of the State of California

San Francisco—1122 Phelan Building, 760 Market Street (2), UNderhill 1-8700.
Sacramento—631 J Street.
Los Angeles—State Office Building (12), MAdison 6-1515.
Director, Malcolm Merrill, 603 Phelan Building, 760 Market Street, San Francisco 2.

Medical Schools in California

University of California School of Medicine, Medical Center, San Francisco 22.

Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15. Dean: Windsor C. Cutting, M.D.

University of Southern California School of Medicine, 3551 University Avenue, Los Angeles 7. Dean: Gordon E. Goodhart, M.D.

College of Medical Evangelists School of Medicine, 312 North Boyle Avenue, Los Angeles 33. Dean: Harold Shryock, M.D.

University of California at Los Angeles, School of Medicine, Hilgard Avenue, Los Angeles 24. Dean: Stafford L. Warren, M.D.

(For roster of County Society officers, see last month's issue)

Compares British, United States Family Doctors

The American general practitioner "can and does" do a better job in many ways than the family doctor in Britain, a Scotch physician said recently.

Dr. Charles M. Fleming, after a three months' tour in the United States, reported on his comparisons in a recent issue of the *Journal of the American Medical Association.*

He said he was "impressed" with the standard of work done by most general practitioners here, the reactions of patients, and the confidence of all in the future of general practice.

The British general practitioner slowly has been displaced from his position as "family doctor" by the encroachments of socialized medicine and the growth of the clinic system and specialization, he said. Often the family doctor acts only as "a signpost directing the patient to the right hospital department," since almost all but the simplest cases are referred to hospitals for diagnosis and treatment.

This is because the British National Health Service "started at the wrong end," he said. It has made it easier for the patient to enter the hospital by raising the status of the specialist, even though "it has been pointed out that the way to run a health service efficiently and economically is to keep the patient out of the hospital whenever possible."

According to Dr. Fleming, American family doctors have better equipment and use it more; save time by using extra help, such as nurses, secretaries, and laboratory technicians, and are better off in holding some kind of hospital appointment. He said it is "generally accepted" that an American general practitioner should have the privilege of caring for his own private patients in a hospital. This practice is advocated by the American Medical Association, the American College of Surgeons, and the American Hospital Association.

He said it is easier for an American physician to enter general practice, while in Britain specialist trainees are going into general practice only because hospital staffs are filled. "So-called health centers with group practice, which were envisaged before it was realized the national health service would cost nearly $1,400,000,000 yearly, now exist in the imagination only," he said. Group practice is commoner in the United States, giving more opportunities for greater efficiency to the "key member of the team, the family doctor." This results in better service for the patient. The scope of the American family doctor's practice is wider, and he still performs major operations, which is not done in Britain.

"The general practitioner surgeon is now unknown in Britain; he disappeared with the advent of the National Health Service in 1948," Dr. Fleming said. "In the United States, the general practitioner is encouraged to investigate and treat his patients with a full range of diagnostic and therapeutic facilities, which in Britain are available only to the hospital specialist."

INDEX TO *California Medicine* ADVERTISERS

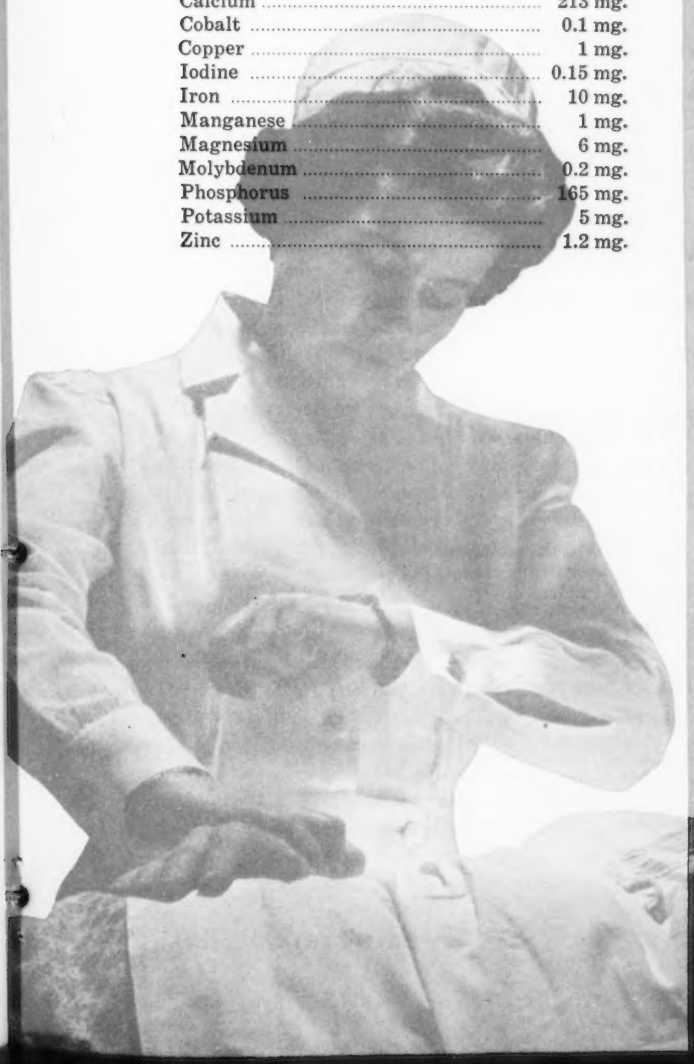
to support the healthy...

Viterra®

a vitamin-mineral formulation of 21 balanced factors, supplementing the depleted diet

each capsule of Viterra contains:

Vitamin A	5,000 U.S.P. Units
Vitamin D	500 U.S.P. Units
Vitamin B_{12}	1 mcg.
Thiamine Hydrochloride	3 mg.
Riboflavin	3 mg.
Pyridoxine Hydrochloride	0.5 mg.
Niacinamide	25 mg.
Ascorbic Acid	50 mg
Calcium Pantothenate	5 mg.
Mixed Tocopherols *(Type IV)*	5 mg.
Calcium	213 mg.
Cobalt	0.1 mg.
Copper	1 mg.
Iodine	0.15 mg.
Iron	10 mg.
Manganese	1 mg.
Magnesium	6 mg.
Molybdenum	0.2 mg.
Phosphorus	165 mg.
Potassium	5 mg.
Zinc	1.2 mg.



to fortify the sick...

Viterra® Therapeutic

high-potency capsules specifically designed to meet increased nutritional needs during illness

each capsule of

Viterra Therapeutic

contains:

Vitamin A	25,000 U.S.P. Units
Vitamin D	1,000 U.S.P. Units
Thiamine Mononitrate	10 mg.
Riboflavin	5 mg.
Vitamin B_{12}	5 mcg.
Niacinamide	100 mg.
Ascorbic Acid	150 mg.
Calcium	103 mg.
Cobalt	0.1 mg.
Copper	1 mg.
Iodine	0.15 mg.
Iron	10 mg.
Magnesium	6 mg.
Manganese	1 mg.
Molybdenum	0.2 mg.
Phosphorus	80 mg.
Potassium	5 mg.
Zinc	1.2 mg.

Roerig Rx

536 Lake Shore Drive
Chicago 11, Illinois

More Interns, Residents Now in Training

There are now 75 per cent more physicians in full-time graduate training in U. S. hospitals than there were 10 years ago, it was recently reported.

On the first of this year there were about 26,000 interns and residents training in hospital staff positions, compared to about 15,000 in 1945, according to the 28th annual report of the Council on Medical Education and Hospitals of the American Medical Association. The report appeared in a recent issue of the *Journal of the American Medical Association.*

During the same period the number of openings for full-time graduate work doubled. On January 1, 1954, there were 34,172 openings compared to 16,095 in 1945. As of September 1, a total of 33,985 positions were open for the 1954-55 year, including 22,763 residencies and fellowships, and 11,222 internships. Residency openings decreased from 23,630 last year and internships increased from 11,006.

In 1945 applicants filled about 15,000, or more than 90 per cent, of the openings. In 1952-53 they filled about 74 per cent, or 26,894 of the positions. The council said this indicated a fundamental problem—the opportunities for intern and resident service had been increasing more rapidly than the number of available applicants. However, the percentage of filled positions increased to about 79 for the 1953-54 year.

The council helps provide better medical care by approving for training programs only hospitals meeting satisfactory basic educational and clinical standards. As of January 1, there were 1,347 approved hospitals offering such training. Hospitals offering internship programs increased only 7 per cent in 10 years, while the number of available positions rose 26 per cent. The council said the number of positions offered varies from year to year depending on the demand for staff members by approved hospitals. It said this suggests that careful self-appraisal by hospitals of their individual needs could result in "a sharp decline if not in the elimination of" the present excess of positions available. This appraisal should be from the standpoint "not alone of services required but of their potential for providing a worth-while educational experience for these graduates."

About 90 per cent of the interns entered rotating programs designed to lay a foundation for general practice residencies or further specialty training. The trend toward higher pay for interns seemed to be slowing, the council said. Last year 44 per cent of the hospitals paid more than $150 a month; this year 30 per cent paid that. However, hospitals paying more than $200 had a lower occupancy rate for their positions than the lower-salary hospitals, indicating that the salary level "is not a decisive factor in attracting an intern staff."

Blood Foundation Approved Tentatively

Both the American Association of Blood Banks and the American Society of Clinical Pathologists have given "approval in principle" to a plan to establish a nationwide blood-collecting, storing, and distributing system, based on the clearing house plan used by banks to exchange funds and credits. Both groups acted at their meetings in Washington, D. C. Under the system, a blood "deposit" could be made anywhere in the country and credited to anyone in another location. The proposed "National Blood Foundation" also has the approval of the American Medical Association.

—A.M.A. Washington Letter

World Medical Association Needs Immediate Financial Support

Doctors who are members of the United States Committee of the World Medical Association now are receiving letters, citing the present financial plight of the W.M.A. and urging immediate financial support to build up a depleted treasury.

In an urgent appeal from Dr. Louis H. Bauer, secretary-treasurer of the U. S. Committee, members are being asked to talk about the W.M.A. to their friends and sign them up. The membership fee is only $10.

"At the moment," Dr. Bauer stated, "we do not

(Continued on Page 18)

RHINALGAN®

NASAL DECONGESTANT

Uniformly *Safe!* FOR INFANTS • CHILDREN ADULTS AND AGED

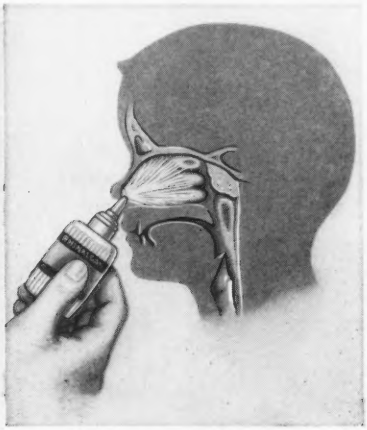
DOES **NOT** CONTAIN ANY ANTIBIOTIC

Does not affect
BLOODPRESSURE
RESPIRATION
CENTRAL NERVOUS SYSTEM

ENTIRELY Safe! in
CARDIAC—DIABETIC
PREGNANCY—THYROID
AND HYPERTENSION CASES

Authoritative Proof sent on request.

COMPLETELY FREE OF SIDE-EFFECTS... no cumulative action... no overdosage problem... non-toxic.



For *Safety!* USE RHINALGAN

NOW Modified Formula assures *PLEASANT, PALATABLE TASTE!*

FORMULA: Desoxyephedrine 0.22%; Antipyrine 0.28% w/v in an isotonic aqueous solution with 0.02% Laurylamine Saccharinate. pH 6.4. ± 0.1. Stable. Will not discolor or otherwise deteriorate. All sweetness entirely eliminated.

Available on YOUR prescription only!

Reference to RHINALGAN:

1. Van Alyea, O. E., and Donnelly, W. A.: E.E.N.&T. Monthly, 31, Nov. 1952.
2. Fox, S. L.: AMA Arch. Otolaryn., 53, 607-609, 1951.
3. Molomut, N., and Harber, A.: N.Y. Phys., 34, 14-18, 1950.
4. Lett, J. E., (Lt. Col. MC-USAF) Research Report, Dept. Otolaryn., USAF School Aviat. Med., 1952.
5. Hamilton, W. F., and Turnbull, F. M.: J. Amer. Pharm. Ass'n., 7, 378-382, 1950.
6. Browd, Victor L.: Rehabilitation of Hearing, 1950.
7. Kugelmass, I. Newton: Handbook of the Common Acute Infectious Diseases, 1949.

NEW O TOS-MO-SAN—A specific in Suppurative Ear Infections (Acute or Chronic).

AURALGAN—After 40 years STILL the auralgesic and decongestant.

RECTALGAN-Liquid—For symptomatic relief in: Hemorrhoids, Pruritus, Perineal Suturing

DOHO CHEMICAL CORP., 100 Varick Street, New York 13, N. Y.


Let these experts on relaxing show you
how to live with HIGH BLOOD PRESSURE
PARKE, DAVIS & CO.


How to select a family doctor
PARKE, DAVIS & CO.


DO YOU KNOW THIS MAN?
HIS NEGLIGENCE IS CAUSING THOUSANDS OF DEATHS FROM HEART DISEASE
PARKE, DAVIS & CO.

When


There's a brighter outlook now for the child with EPILEPSY...
PARKE, DAVIS & COMPANY


How many of these people need a doctor?
PARKE, DAVIS & COMPANY


IS THERE SOME OF HER SPIRIT IN YOU?

PARKE-DAVIS speaks to the public...

WHAT people think about doctors is pretty important to the future of the practice of medicine in this country.

Can the power and influence of advertising—the *right kind* of advertising—be employed to bring home to people what the physician of today can really do for them, if they'll only give him the opportunity?

Parke, Davis & Company's answer to this question is their "See Your Doctor" advertising program which they started twenty-six years ago and have been carrying on ever since. Each message in this continuing series emphasizes the same major theme: *the importance of prompt and proper medical care.*

No products are mentioned; that is the province and responsibility of the physician.

Because these messages are all "picture stories" that dramatize the informative and serious material they present, they are among the best-read advertisements being published today. Above everything else, we try for plausible, believable messages that will nudge the reader into action without either raising false hopes or scaring him. We want him to have not only increased confidence in his doctor, but in the professional background and skill of the pharmacist who fills the prescription, and in the medicine itself.

We naturally hope that the reader will come to know and recognize Parke-Davis as a leader in a fundamental American industry, and to associate our name and label with manufacturing skill, careful testing, and enlightened research.

A program of this kind, if it is to do the greatest good, must be brought to the attention of millions of people. That is why the "See Your Doctor" messages have appeared and are currently published in the SATURDAY EVENING POST, LIFE, TIME, NEWSWEEK, TODAY'S HEALTH, and other leading magazines.

While the broad problem is one which admittedly challenges the skill and resourcefulness of many organizations that have the interest of Medicine at heart, Parke-Davis is proud to have a part in pioneering and developing a type of advertising approach which is proving increasingly effective in meeting this challenge. *PARKE, DAVIS & COMPANY, DETROIT 32, MICHIGAN.*

MEDICAMENTA VERA

World Medical Association Needs Immediate Financial Support

(Continued from Page 14)

have sufficient funds either to handle the General Assembly or run the association for another year."

Since its founding in 1947, the W.M.A. has earned increased respect from international governmental organizations.

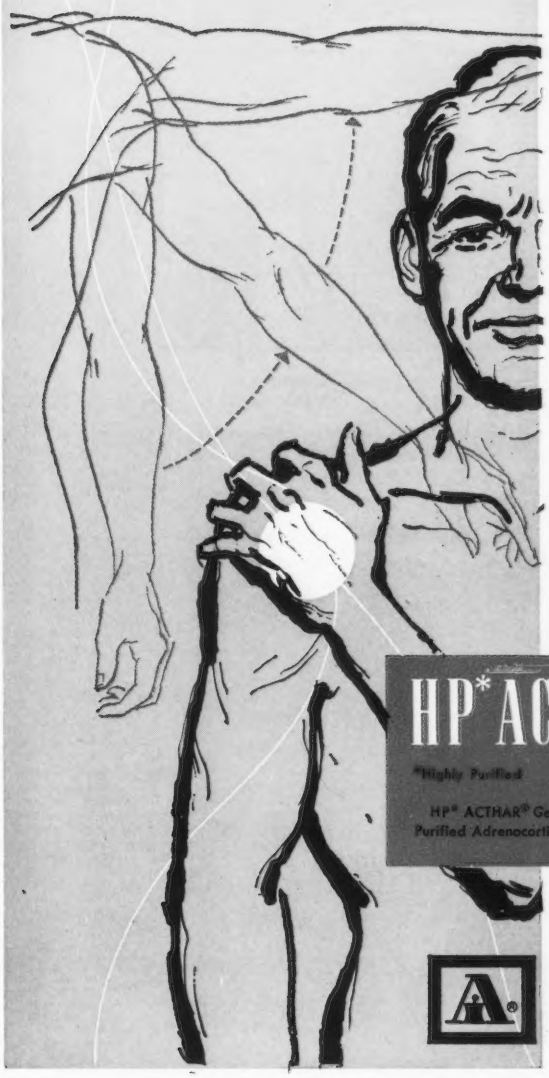
"But," as Dr. Bauer says, "there is a constantly growing tendency for decisions affecting all of medicine to be made at the international level. This tendency is a threat not only to the future of medicine itself, but to the rights and privileges of every practicing physician. The World Medical Association is the only international organization which can and does speak from the nongovernmental standpoint and from the standpoint of free enterprise. It can only continue to defend your interests if it has adequate financial support."

Dr. Bauer explained that W.M.A. support from industry as a whole has decreased this year and the campaign to increase individual membership in the U. S. Committee "has not been as successful as we had hoped." Consequently, he is asking doctors all over the country to join in a renewed membership campaign. Application blanks can be secured from Dr. Louis H. Bauer, World Medical Association, 345 East Forty-sixth Street, New York 17, N. Y.

—The A.M.A. Secretary's Letter

PROFOUND RELIEF AND
QUICK REHABILITATION

IN acute bursitis



Profound and rapid therapeutic success in bursitis, especially in the acute stage, is obtained with HP*ACTHAR *Gel*. Cases refractory to other types of therapy have responded to HP*ACTHAR *Gel*, regardless of the severity of the condition. Calcium deposits may disappear.

HP*ACTHAR *Gel*, a new repository ACTHAR with rapid response and sustained action, is as easily administered as insulin with a minimum of discomfort, whether injected intramuscularly or subcutaneously. It is economical too, far less time and money being spent to restore the patient's working ability.

HP*ACTHAR *Gel*

(IN GELATIN)

*Highly Purified

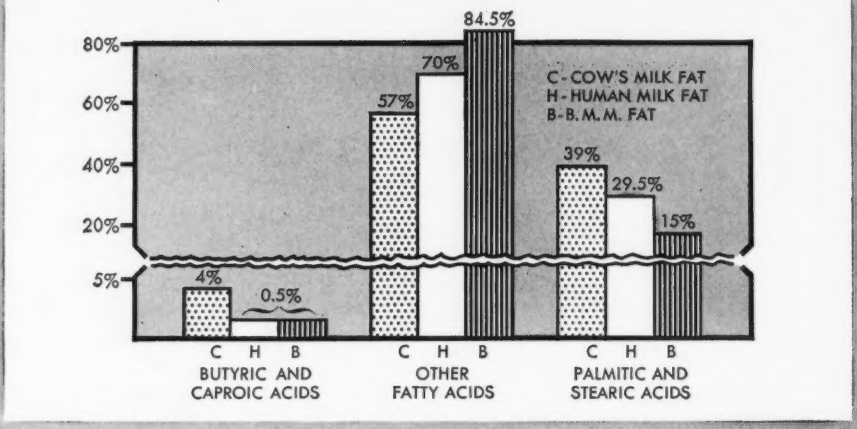
HP* ACTHAR® Gel is The Armour Laboratories Brand of Purified Adrenocorticotropic Hormone—Corticotropin (ACTH).

The small total dose required affords economy and virtual freedom from side actions.

THE ARMOUR LABORATORIES
A DIVISION OF ARMOUR AND COMPANY · CHICAGO 11, ILLINOIS

THE FATS IN... *Baker's Modified Milk*

...ARE READILY TOLERATED AND DIGESTED



● Baker's Modified Milk provides approximately 85% of its fatty acid composition in the more readily tolerated and digestible range (as shown in the fat chart above). This compares with 57% for cow's milk fat and 70% for the fat of human milk.

The fat composition of Baker's is only one of many reasons why this product is used so successfully in feeding the newborn term infant, the premature infant, and the older infant who does not "handle" butterfat.

Baker's is a high-quality* milk diet complete in all known essential nutrients.

★

*Made from Grade A milk (U. S. Public Health Service Milk Code) which has been modified by replacement of the milk fat with vegetable and animal fats and by the addition of carbohydrates, vitamins, and iron.

★

BAKER'S MODIFIED MILK

THE BAKER LABORATORIES INC.

Milk Products Exclusively for the Medical Profession

Main Office: Cleveland 3, Ohio
Plant: East Troy, Wisconsin

Division Offices: Atlanta, Dallas, Denver, Greensboro, N. C., Los Angeles, San Francisco, Seattle

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

new

in acne

classic medication
formulated for assured
freshness and stability

PRONAC*

(Brand of White Lotion, Modified)

stabilized† powder for
patient-prepared
polysulfide lotion

Physicians are agreed that to be effective in acne, polysulfide lotion (lotio alba, N.F.) must be freshly prepared, but this is rarely practical because of instability of the classic ingredients. Now, available in the form of a completely stable powder for mixing by the patient just prior to use, PRONAC adds the advantages of guaranteed freshness to the "time-tested" values of white lotion for more effective treatment of acne.

PRONAC is available in units of 12 sealed packets. Each packet is sufficient to prepare ½ oz. of fresh lotion when mixed with ½ oz. of water.

- always fresh
- unvarying potency
- assured stability
- minimal odor
- simply prepared

FOUGERA

E. FOUGERA & COMPANY, INC • 75 Varick Street, New York 13, N. Y.

T. M. †PATENT APPLIED FOR

Coal Miners May Suffer From "Combat Fatigue"

Many coal miners with respiratory disorders also are suffering from emotional stress much like combat fatigue, a team of four psychiatrists and physicians reported recently.

Some could go back to work in the mines if treated psychologically and physically, the doctors wrote in a recent issue of the *Journal of the American Medical Association.* Unions and employers should help in their rehabilitation.

The Cincinnati physicians said they studied 40 men who apparently were incapacitated by shortness of breath, coughing, chest pain, and "smothering." More than half were suffering from emotional as well as physical disorders; and about a third from emotional difficulties alone. Although all were unable to work, many might return to mining if helped. Others could do non-mining work if they could be made to understand the reason for their troubles and realize that mining is not their only possible occupation.

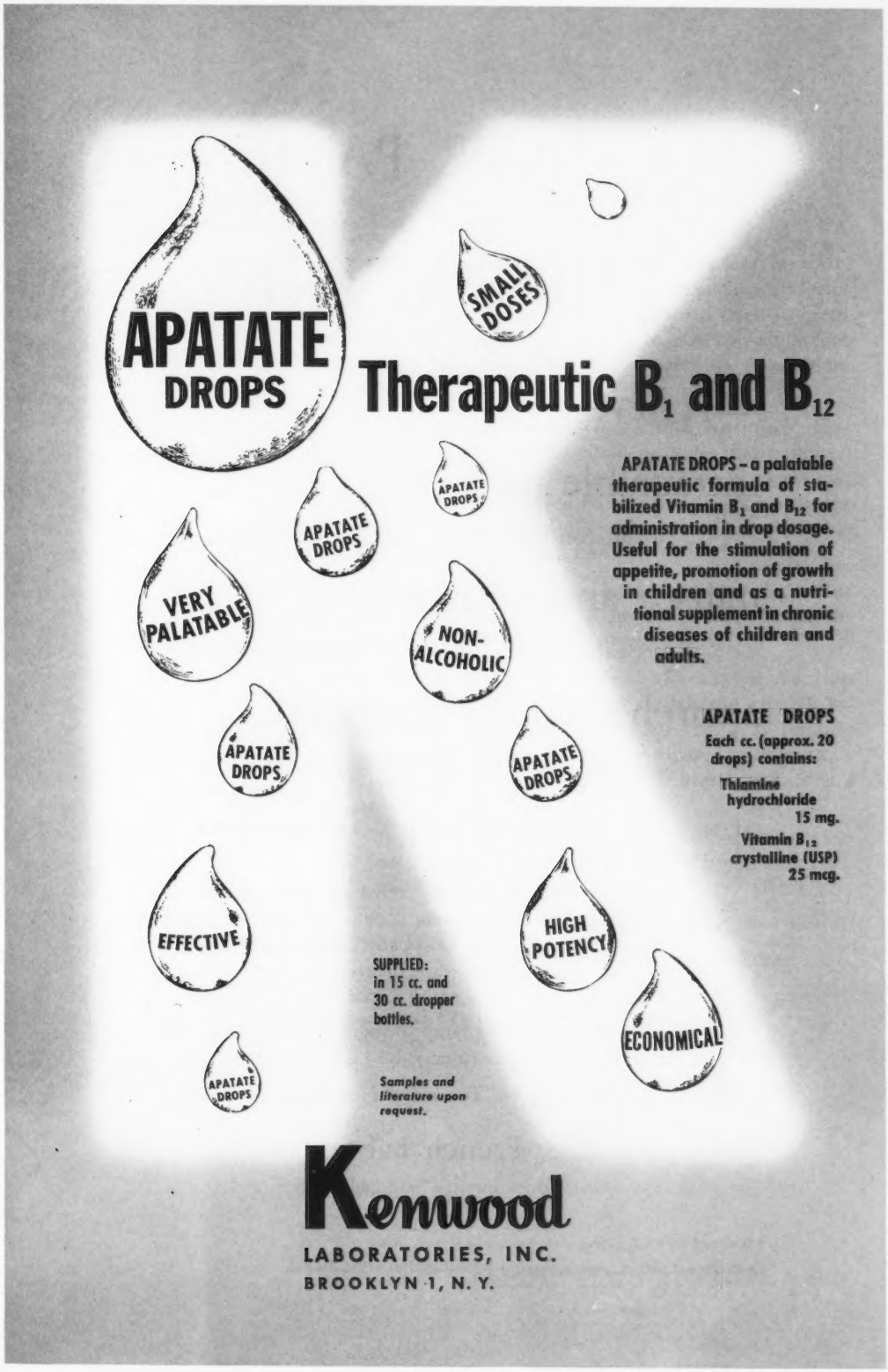
The doctors said the development of emotional and respiratory disorders was easy to understand from the life history and circumstances of the men. Most of them had "worked hard in over-compensation for childhood deprivations." They had been over-solicitous for other miners and other members of their families, in trying to make up for childhood rivalries and for guilty feelings about surviving while other miners died.

After deaths, accidents, or narrow escapes, they unknowingly began to fear mining hazards while denying the fear even to themselves. When they developed respiratory ailments and were told by a physician that they had a physical disease, they unconsciously hid behind the disease symptoms to avoid further risk. However, this did not really help because without jobs they had no way to work off their aggressive feelings about mining and miners, which were the root of the whole problem.

The life story of most of the miners began with money difficulties and resulting poor education, hard work, fighting among brothers and sisters, and death in the family. The men started to work in their teens and helped raise younger brothers and sisters, or married and had children of their own to support. Later they felt bitter because they missed opportunities others had enjoyed, but they worked hard to give their children better lives than their own. They managed to hide their fears while living through explosions and falls that killed or maimed friends. Sometimes after a useless attempt to save a worker, or after removing a body and notifying the family, the men had nightmares and woke up choking, short of breath, and weak.

When first seen by physicians and psychiatrists, the miners studied were from 36 to 64 years old, had been having respiratory symptoms for three to ten

(Continued on Page 32)


APATATE DROPS
SMALL DOSES
Therapeutic B_1 and B_{12}
APATATE DROPS
APATATE DROPS
VERY PALATABLE
NON-ALCOHOLIC
APATATE DROPS
APATATE DROPS
APATATE DROPS – a palatable therapeutic formula of stabilized Vitamin B_1 and B_{12} for administration in drop dosage. Useful for the stimulation of appetite, promotion of growth in children and as a nutritional supplement in chronic diseases of children and adults.
APATATE DROPS
Each cc. (approx. 20 drops) contains:
Thiamine hydrochloride 15 mg.
Vitamin B_{12} crystalline (USP) 25 mcg.
EFFECTIVE
HIGH POTENCY
ECONOMICAL
APATATE DROPS
SUPPLIED: in 15 cc. and 30 cc. dropper bottles.
Samples and literature upon request.
Kenwood
LABORATORIES, INC.
BROOKLYN 1, N. Y.

rauwolfia in its optimal form

- ***Rauwiloid is not the crude rauwolfia root.*** Rauwiloid presents the total hypotensive activity of the pure whole Rauwolfia serpentina (Benth.) root—but it is freed from the inert dross of the whole root and its undesirable substances such as yohimbine-type alkaloids.

- ***Rauwiloid is not merely a single contained alkaloid of rauwolfia.*** Rauwiloid provides the balanced action of the several potent alkaloids in rauwolfia; reserpine—regardless of the brand name under which it is marketed—is only one of the desirable alkaloids in Rauwiloid.

- ***Rauwiloid contains, besides reserpine, other active alkaloids, such as rescinnamine,***[1,2] reported to be more potent than reserpine.

- ***Rauwiloid is the original alseroxylon fraction of unadulterated Rauwolfia serpentina (Benth.)***—rauwolfia in its optimal form—virtually no side actions—no known contraindications. It rarely needs dosage adjustment. The dose for most patients is 2 tablets (2 mg. each) at bedtime.

If you have prescribed rauwolfia in other forms, it will not take many patients to convince you that Rauwiloid serves better. Please write for clinical samples.

1. Klohs, M. W.; Draper, M. D., and Keller, F.: J. Am. Chem. Soc. *76*:2843 (May 20) 1954.

2. Cronheim, G.; Brown, W.; Cawthorne, J.; Toekes, M. I., and Ungari, J.: Proc. Soc. Exper. Biol. & Med. *86*:110 (May) 1954.

IN HYPERTENSION

Rauwiloid®

Riker LABORATORIES, INC. LOS ANGELES 48, CALIF.

for the patient
who balks
at
taking
hydrophilic
colloids

. . . prescribe

L. A. FORMULA

in milk or
orange juice

L. A. FORMULA

a bulk producer
unsurpassed
for
patient acceptance

L. A. FORMULA — *50% Plantago ovata concentrate dispersed in lactose and dextrose and refined to a unique particle size.*

Available—7 and 14 oz. containers. Samples on request.

BURTON, PARSONS & COMPANY • Washington 9, D. C.

Diesel Conversion Brings Skin Disease Problems

Use of a different anti-rust agent by railroads and other industries converting to diesel power might prevent a hard-to-treat skin disease, a Pittsburgh physician reports. Dr. William B. Guy, of the University of Pittsburgh School of Medicine, said the disease has been increasing since industries began converting to diesel power and cooling systems.

He said another type of skin disease, caused by solvents and fuel oil used to clean diesel parts, can be avoided by wearing protective clothing, using skin creams, and having good washing facilities. However, about the only solution for men who develop strong sensitivity to solvents or diesel fuel fumes is to find other jobs, Dr. Guy said in a recent issue of *Archives of Dermatology and Syphilology*, published by the American Medical Association.

The "most distressing" aspect is that such skin trouble often prevents men with long years of railroad service from continuing employment in railroad shops, he said. Giving them supervisors' or janitors' jobs not directly in contact with machinery won't always help, since even exposure to the fumes sometimes causes skin disease.

One of the main differences between steam and diesel engine work is that men who clean steam engine parts usually suffer skin disease only if accidentally splashed by hot, highly alkaline cleaning compounds. In spraying engines with diesel fuel oil, during the cleaning process, workers are exposed to the oily mist. Since "practically everything in a railroad shop and roundhouse becomes contaminated with diesel fuel," it is "practically impossible" to avoid contact with it.

"We have seen railroad shop workers, many of them highly skilled, with years of seniority working with steam engines, who, having developed a diesel oil dermatitis while in intimate contact with the material, could no longer work in railroad shops in any capacity," Dr. Guy said. "Attempts to use them in situations where their contacts would be minimized . . . would result in prompt recurrence of their dermatitis."

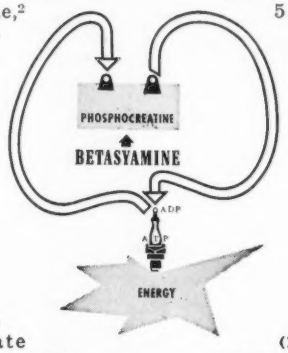
The skin problems have reached "the proportions of a dilemma" because of the use of chrome salts as an anti-rust agent in diesel cooling systems, he said. Chrome salt skin disease as an occupational hazard has been reported in woolen mills, aircraft plants, air conditioning equipment maintenance, chrome compound manufacturing, and in lithographic industries. Cases have developed months or years after the patient began such work. Many of them were from "casual and incidental contact" by persons not even connected with filling, emptying or otherwise working directly with cooling systems. Unlike other diesel skin diseases, it does not respond quickly to treatment and removal of the cause.

This kind of skin disease is especially hard to cure and seems to be prolonged by fixation of chrome crystals in the skin itself.

When energy levels are low,

BETASYAMINE recharges the physiologic battery

BETASYAMINE marks a significant advance in Hi-Energy Compound Replacement Therapy for the supportive management of such debilitating conditions as **Anxiety Tension Fatigue Syndromes, Poliomyelitis, Multiple Sclerosis, Cardiovascular Disease, Muscular Dystrophy** and other **low energy states.** As a balanced combination of immediate precursors of creatine,[1] Betasyamine accelerates formation and utilization of phosphocreatine,[2] storehouse of high physiologic energy.[3] Because phosphocreatine levels have been found to be low in many debilitating diseases,[4] replacement therapy with Betasyamine has been demonstrated clinically effective, both by objective and subjective improvement in a significant number of cases. In such patients, the ingestion of adequate amounts of Betasyamine for a minimum of three weeks has usually been followed by **freedom from fatigue, a marked sense of well-being, greater energy output, improved articulation and ambulation, relief from anginal pain and dyspnea, more rapid progress during physiotherapy and during psychotherapy.**[5,6,7] Betasyamine is nontoxic and produces no untoward or artificially stimulating effects. In properly selected patients with low physiologic energy, Betasyamine response varies within individual limits, usually in proportion to dosage and length of administration. For greatest therapeutic benefit, Betasyamine should be accompanied by routine manipulation therapy or ambulatory activity. (Cardiac patients should be cautioned not to exceed functional capacity. Betasyamine produces no appreciable results in healthy persons.) Betasyamine has no contraindication in recommended dosage: for children 6-12, 1 to 2 tablespoonfuls Emulsion (or 5 to 10 Tablets); for patients over 12, up to 5 tablespoonfuls Emulsion (or up to 25 Tablets) daily, preferably in divided doses after meals, for at least three weeks to obtain demonstrable response.



Supplied: **Betasyamine Emulsion** (Bottles of 16 fluid ounces); **Betasyamine Tablets** (Bottles of 200).

(1) WEST, E. S. and TODD, W. R.: Textbook of Biochemistry, The Macmillan Company, New York, 1952, pp. 1110, 1119. (2) PETERSON, R. D. et al: Federation Proc. *839*: 254 (March) 1953. (3) BEST, C. H. and TAYLOR, N. B.: The Physiological Basis of Medical Practice, Williams and Wilkins Company, Baltimore, 1950, p. 392. (4) BORSOOK, M. E.; BILLIG, H. K., and GOLSETH, J. G.: Ann. West. Med. & Surg. *6*:423 (July) 1952. (5) ALDES, J. H.: (Abstract) Bull. Biol. Sciences Foundation *1*:4 (April) 1954. (6) DIXON, H. H. et al: West. J. Surg. Obstet. & Gynec. *62*:338 (June) 1954. (7) GRAYBIEL, A. and PATTERSON, C. A.: Ann. West. Med. & Surg. *5*:863 (Oct.) 1951.

BETASYAMINE®

Manufactured and distributed exclusively by **Amino Products Division**

International Minerals and Chemical Corporation

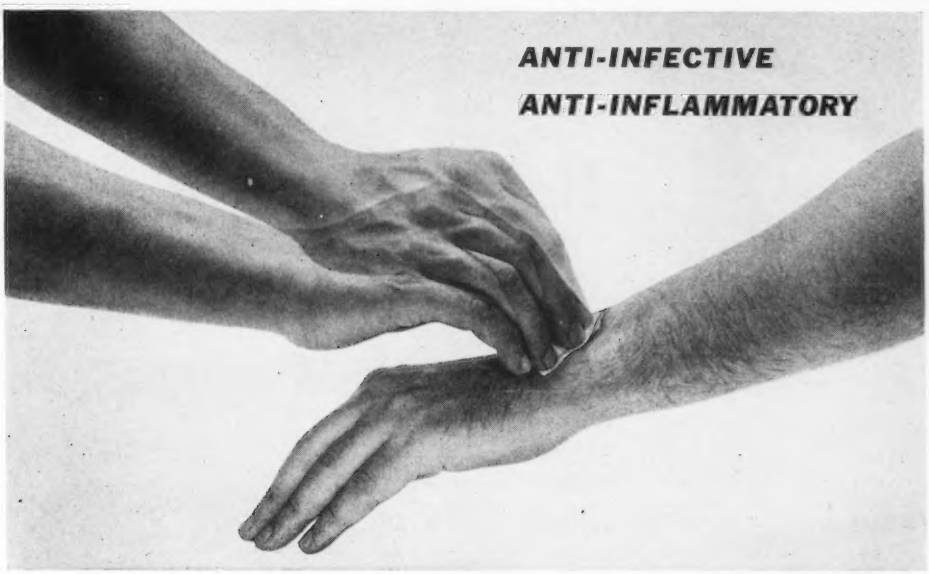
1250 Wilshire Blvd., Los Angeles, California • 20 N. Wacker Drive, Chicago 6, Illinois

Produced and distributed under license from California Institute Research Foundation, Pasadena, California.

Complete detailed literature available on request. **Patent Pending.**

FORMULA: Betasyamine Emulsion—each tablespoonful (15 cc.) contains: Betaine (hydrate), 5.0 gm. (equivalent to 4.33 gm. betaine anhydrous); Glycocyamine, 1.0 gm. Bottles of 16 fluid ounces. **Betasyamine Tablets**—each tablet contains Betaine (anhydrous), 0.866 gm.; Glycocyamine, 0.2 gm. Bottles of 200 tablets.

DUAL ACTION in dermatologic therapy



Terra-Cortril*

topical ointment

new, easy-to-write name for

CORTRIL Topical Ointment with TERRAMYCIN® Hydrochloride

combined anti-infective, anti-inflammatory action for rapid, rational local therapy in a wide range of dermatoses.

TERRAMYCIN provides **proved, established** broad-spectrum action against threatened or coexisting infection.

CORTRIL provides **rapid** relief of discomfort due to inflammation or itching.

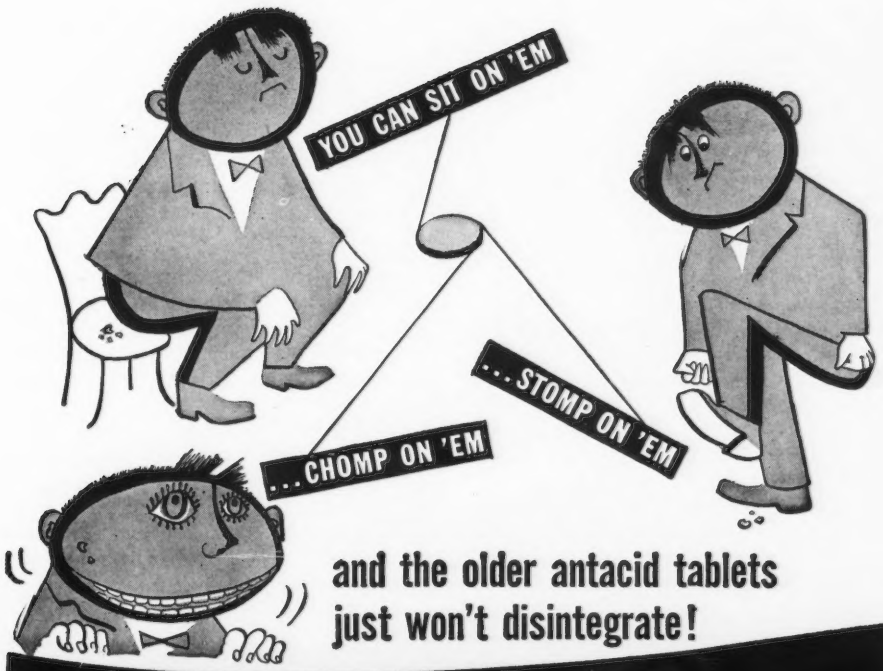
supplied: in ½-oz. tubes; 1% CORTRIL (hydrocortisone) and 3% TERRAMYCIN (oxytetracycline hydrochloride) in an easily applied ointment base.

also available:

CORTRIL *Topical Ointment*
CORTRIL *Tablets*
CORTRIL *Acetate Ophthalmic Ointment*
TERRA-CORTRIL *Ophthalmic Suspension*
CORTRIL *Acetate Aqueous Suspension for intra-articular injection*

Pfizer PFIZER LABORATORIES *Division, Chas. Pfizer & Co., Inc. Brooklyn 6, New York*

* brand of oxytetracycline and hydrocortisone



and the older antacid tablets just won't disintegrate!

now TREVIDAL® tablets

break up in less than a minute, assuring rapid yet prolonged relief of hyperacidity.

EACH TREVIDAL TABLET CONTAINS:

Balance of ingredients avoids constipation, diarrhea, or alkalosis	Aluminum hydroxide gel, dried . . . 90 mg. Magnesium trisilicate . . . . . 150 mg. Magnesium carbonate . . . . . 60 mg. Calcium carbonate . . . . . 105 mg.
Unique vegetable mucin supplies protective coat to irritated stomach lining	Regonol*† . . . . . 100 mg.
Binder controls and extends antacid activity	Egraine* . . . . . 45 mg.

AVAILABLE IN BOXES OF 100 TABLETS, SPECIALLY STRIPPED FOR EASY CARRYING.

†Cyamopsis tetragonoloba gum
*Trade Marks

Organon INC. • ORANGE, N. J.

Coal Miners May Suffer From "Combat Fatigue"

(Continued from Page 22)

years, and had not been working for one to two years. Many were helped by the United Mine Workers welfare fund, but were unhappy about being jobless. They might have done other jobs but didn't understand their problems and were convinced that mining was their only suitable work.

They were much like "a combat veteran in war who has 'had it' after prolonged battle stress and deaths of 'buddies,' but who could, nevertheless, be rehabilitated for noncombat duty or civilian life by psychiatric treatment and therapeutic occupation." Although being out of the mines relieved the men's anxiety about accidents, they felt insecure without jobs, and had lost their only outlet for aggressive feelings. As a result they became more depressed and more incapacitated.

The physicians made several recommendations for medical and social means to stop the pattern of "incapacity, unhappiness and nonproductivity." Physicians should recognize the importance of emotional factors and treat them before returning to mine work becomes "out of the question." Miners could be helped in the same way as battle casualties due to emotional fatigue.

However, "employers and unions have a responsibility for opening up earlier opportunities for treatment and for rehabilitation at less hazardous occupations if improvement in medical care is to result in solution . . . of the problem," they said. "Finally, an educational program among miners concerning the psychological and physiological reactions to the stresses of their occupation would help to reduce the disabilities that are developing at present."

The report was made by Drs. W. Donald Ross, Lee H. Miller, H. Halbert Leet, and Frank Princi, of the University of Cincinnati College of Medicine and the Cincinnati General Hospital.

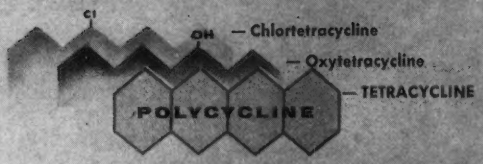
DR. A. A. MORRISON, president, California Medical Association—"When all persons interested in legislative or other phases of prepaid medical care start putting the patient's welfare first, rather than their own personal aggrandizement or the number of votes which might be influenced; when they realize all parties affected have problems and a right to equal consideration; when they realize that problems not only vary from state to state but from area to area within states; and when there is a real desire to sit around a conference table to discuss these problems on a realistic rather than theoretical basis, then and only then will there be progress made toward a reasonable and satisfactory solution."

—The A.M.A. Secretary's Letter

Thoroughbreds are born, not made—

FROM A PRINT "HONORS EVEN" BY EDWIN MEGARGEE. NEW YORK. PUBLISHED & COPYRIGHTED 1943 BY FRANK J. LOWE.

POLYCYCLINE *is the* ONLY *tetracycline produced directly by fermentation from a new species of Streptomyces isolated by Bristol Laboratories . . . rather than by the chemical modification of older antibiotics.*



The most modern
Broad-Spectrum Antibiotic

POLYCYCLINE

TRADE MARK

(TETRACYCLINE *Bristol*)

the only tetracycline produced directly by fermentation from a new species of Streptomyces isolated by Bristol Laboratories...rather than by the chemical modification of older broad-spectrum antibiotics.

effective in broad range
against gram-positive and gram-negative organisms.

less toxic
(lower incidence of side reactions)
than older broad-spectrum antibiotics.

more soluble
than chlortetracycline (quicker absorption, wider diffusion).

more stable in solution
than chlortetracycline or oxytetracycline
(higher, more sustained, blood levels).

Now available as

POLYCYCLINE SUSPENSION '250'

(TETRACYCLINE *Bristol*)

—the ONLY oral suspension of tetracycline that is **ready-to-use.** Requires no reconstitution, no addition of diluent, **no refrigeration**—stable at room temperature for 18 months. Has appealing "crushed-fruit" flavor. Supplied in bottles of 30 cc., in concentration of 250 mg. per 5 cc.

Also available as

POLYCYCLINE CAPSULES

(TETRACYCLINE *Bristol*)

— 100 mg., bottles of 25 and 100.
— 250 mg., bottles of 16 and 100.

Dosage:
average adult,
1 gram daily, divided doses;
children in proportion
to body weight.

Bristol
LABORATORIES INC.
SYRACUSE, NEW YORK

American Medical Association European Trip

The American Medical Association, in conjunction with United Air Lines, has arranged an attractive postconvention tour to Europe. Seven countries will be visited: France, England, Italy, Holland, Belgium, Germany, and Switzerland. Physicians and their wives can go to Europe following the annual A.M.A. convention in Atlantic City, June 6-10.

With the A.M.A. meeting being held in Atlantic City, physicians and their wives are offered an unusual opportunity to combine a trip to the East Coast with a visit to these interesting European countries. Similar trips have been sponsored by the California Medical Association, the World Medical Association, and other groups when their meetings have been held on the coast.

The European medical tour party will leave New York International Airport aboard special deluxe chartered airliners on Sunday, June 12. They will arrive in Paris late Monday morning, June 13.

All through the tour the party will stay at luxurious hotels in the many cities that will be visited. Motor coaches will provide interesting side tours to historic and scientific points.

Arrangements are being made for medical meetings in Paris, Rome, Lucerne, and London. Leading European scientists will lecture on topics of current interest to all physicians.

The return trip will be on Saturday, July 9, arriving in New York on the afternoon of July 10. Complete information and reservation blanks can be obtained by writing A.M.A. Post-Convention Tour, c/o United Air Lines, 5959 South Cicero Avenue, Chicago 38, Ill.

—The A.M.A. Secretary's Letter

DR. E. VINCENT ASKEY, Vice-Speaker of A.M.A. House of Delegates—"People seem to resent the American Medical Association as being to blame, in some vague way, for sickness that has created a problem for them.

"As a matter of fact, people actually resent illness. Illness is not planned for. It disrupts the routine of life. It is unpleasant. It is dangerous and threatens to kill those we love. It is expensive.

"We must in some way get people to realize that really the American Medical Association is in their corner in this great fight for health."

—The A.M.A. Secretary's Letter

OUR ADVERTISERS
WILL APPRECIATE
YOUR SUPPORT

ACHROMYCIN
TETRACYCLINE
TABLETS

A widely prescribed form of the outstanding broad-spectrum antibiotic

Sugar-coated, easy-to-swallow ACHROMYCIN Tablets are available in three potencies: 50, 100, and 250 mg.

In each of its many forms, ACHROMYCIN exhibits notable characteristics: it diffuses rapidly in body tissues and fluids; gastrointestinal irritation is rare and mild in nature.

ACHROMYCIN has proved effective against a wide variety of infections including those caused by Gram-positive and Gram-negative bacteria, rickettsia, and certain virus-like and protozoan organisms.

OTHER DOSAGE FORMS

CAPSULES: 50, 100, and 250 mg.

PEDIATRIC DROPS: (see opposite page)

ORAL SUSPENSION: (see opposite page)

SPERSOIDS* Dispersible Powder (Chocolate Flavor): 50 mg. per rounded teaspoonful (3 Gm.), 12 and 25 dose bottles

SOLUBLE TABLETS: 50 mg.

INTRAVENOUS: vials of 100, 250, and 500 mg.

INTRAMUSCULAR: vials of 100 mg. (for dilution with 2 cc. of sterile water or saline)

TOPICAL OINTMENT (3%): ½ and 1 oz. tubes

OPHTHALMIC OINTMENT (1%): ⅛ oz. tubes

EAR SOLUTION (0.5%): 10 cc. dropper bottles

*REG. U.S. PAT. OFF.

Lederle

ACHROMYCIN*

Tetracycline Lederle

ACHROMYCIN*

Tetracycline Lederle

ORAL SUSPENSION and PEDIATRIC DROPS

popular cherry flavor

ACHROMYCIN is available in two cherry-flavored dosage forms that are highly acceptable to patients—particularly children.

The Pediatric Drops are packaged with an easy-to-read graduated dropper. The Oral Suspension, supplied as dry crystals in a 1 oz. bottle. Both Oral Suspension and Pediatric Drops, when reconstituted by the pharmacist or nurse, retain potency for two weeks at room temperature.

ACHROMYCIN, an outstanding broad-spectrum antibiotic, is relatively free from untoward side reactions and provides rapid diffusion in body tissues and fluids.

ORAL SUSPENSION (Cherry Flavor): 250 mg. per teaspoonful (5 cc.), 1 oz. bottles

PEDIATRIC DROPS (Cherry Flavor): 100 mg. per cc. (approx. 5 mg. per drop), 10 cc. bottles

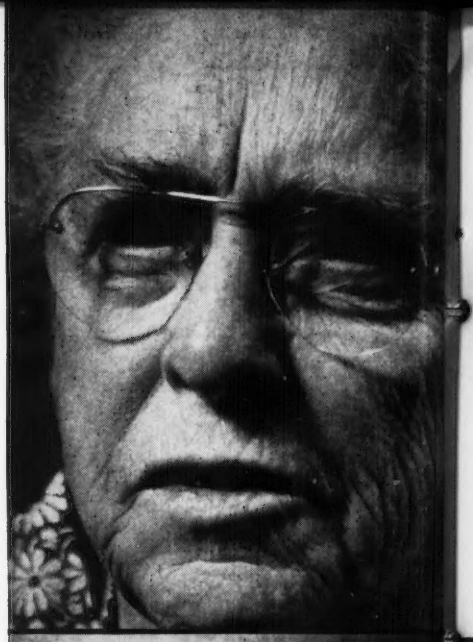
*REG. U.S. PAT. OFF.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY PEARL RIVER, N.Y.

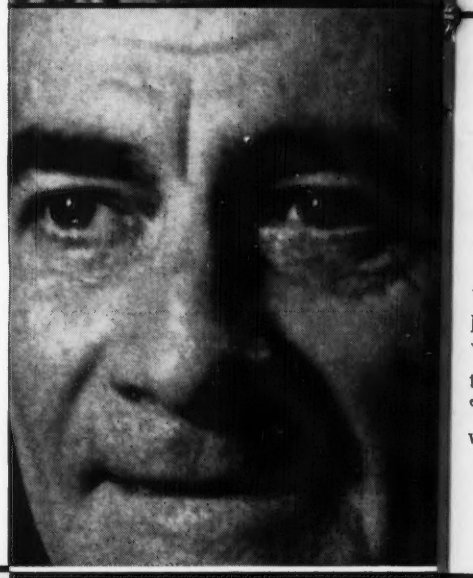
Lederle

. . . a "confused" old lady

'Dexamyl' helped

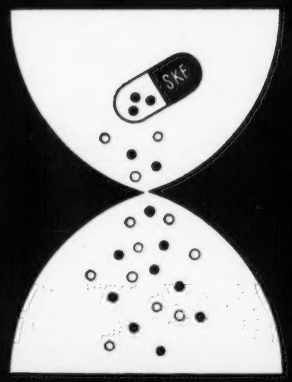


. . . an extremely nervous man



(Photographs and excerpts of case histories from the files of a general practitioner.)

Remember: 'Dexamyl' is now available in the unique 'Spansule' capsule dosage form—to provide smooth, prolonged, uninterrupted mood-ameliorating effect for a period of 10-12 hours—*with just one oral dose.* 'Dexamyl' *Spansule* capsules are available in two strengths (see lower right, facing page).



Patient S. M. (80) was "plagued with nervousness, profound weakness, vertigo, and pain . . . add to this the untimely catastrophic death of a daughter."
'Dexamyl' relieved "her nervous uncertainty, her depressive weariness, her melancholia, and her tearfulness . . . also her vertigo . . . 'Dexamyl' helped her to smile again."

Patient L. H. (51) "had positive tremors of the eyelids, tongue, fingers, lips and voice . . . His complaints always centered about extreme nervousness, jitteriness, depression, and 'all-gone weakness'.
" 'Dexamyl' allayed inward tension . . . gave him a sensation of amelioration and comfort. . . Yet, even in this intensely irritable patient, there were no side effects . . .
"He is now able to work and support himself, which he was unable to do for several years."

Dexamyl*

tablets • elixir • Spansule† capsules

relieves both anxiety and depression

promotes a feeling of composure

'Dexamyl' provides the synergistic action of two mood-ameliorating components: 'Dexedrine' and amobarbital.

Tablets—each containing Dexedrine* Sulfate (dextro-amphetamine sulfate, S.K.F.), 5 mg.; amobarbital, ½ gr. (32 mg.).

Elixir—each teaspoonful (5 cc.) equivalent to one Tablet.

'Dexamyl' ***Spansule*** **(No. 1)**—each containing the equivalent of *two* tablets: 'Dexedrine' Sulfate, 10 mg.; amobarbital, 1 gr. (65 mg.).

'Dexamyl' ***Spansule*** **(No. 2)**—each containing the equivalent of *three* tablets: 'Dexedrine' Sulfate, 15 mg.; amobarbital, 1½ gr. (97 mg.).

Smith, Kline & French Laboratories, Philadelphia

*T.M. Reg. U.S. Pat. Off.
†T.M. Reg. U.S. Pat. Off. for S.K.F.'s brand of sustained release capsules (patent applied for).

"Watchdog" Guards Hospital Patients

A half-million-dollar "watchdog" stands guard over every person who has an operation in any one of 3,000 hospitals—and it doesn't cost the patient a penny.

The watchdog includes hundreds of persons—total strangers to the patient—who know more about the operation than he does, according to an article by Robert R. Goldstein in a recent issue of *Today's Health* magazine, published by the American Medical Association.

They know every detail of the operation and the people who perform it, and can give a step-by-step accounting to representatives of five of "the most powerful medical organizations in the world," the article said. For the patient, this means that "every effort is being made to assure him of the best possible medical care."

This "round-the-clock" watcher of hospital patients is the little-publicized Joint Commission on Accreditation of Hospitals. It is backed by the A.M.A., the American Hospital Association, the American College of Surgeons, the American College of Physicians, and the Canadian Medical Association. They spend nearly half a million dollars a year keeping U. S. and Canadian hospitals operating at top efficiency.

Field representatives tour the country making routine inspections of the more than 3,000 hospitals on the commission's approved list, and of many others seeking its approval. Among the patient safeguards to be found in approved hospitals are fireproofing, adequate room for each patient and isolation space for contagious disease patients, proper diagnostic and treatment facilities under competent medical supervision, and emergency lighting in case of power failure and sterile conditions in operating rooms.

The approved hospital keeps records of anesthetic or drugs given, and any specimen taken from the body during operation is examined and recorded. Approval also depends on constant checks and periodic reviews by the hospital staffs of what is done in their institutions. Rates of mortality, unimproved cases, and cesarean births must be low.

Irregularities of any of these standards might mean loss of approval. Hardly any hospital can meet all the requirements; a score of 75 is needed for full approval, which this year was given to 3,418 of the 7,500 hospitals in the U. S. and Canada. Some other hospitals may meet the standards but have not yet sought commission approval under its voluntary plan of accreditation.

The commission hopes that ultimately every hospital in the two countries will be brought under the program. Its goal is for a standardized program of

(Continued on Page 48)

whenever
cough
therapy
is indicated...

Hycodan®

Bitartrate (Dihydrocodeinone Bitartrate)

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

An AMA Council Accepted Cough Preparation

Syrup (5 mg. per teaspoonful), Oral Tablets (5 mg. per tablet).
May be habit-forming. Average adult dose, 5 mg. t.i.d. p.c.

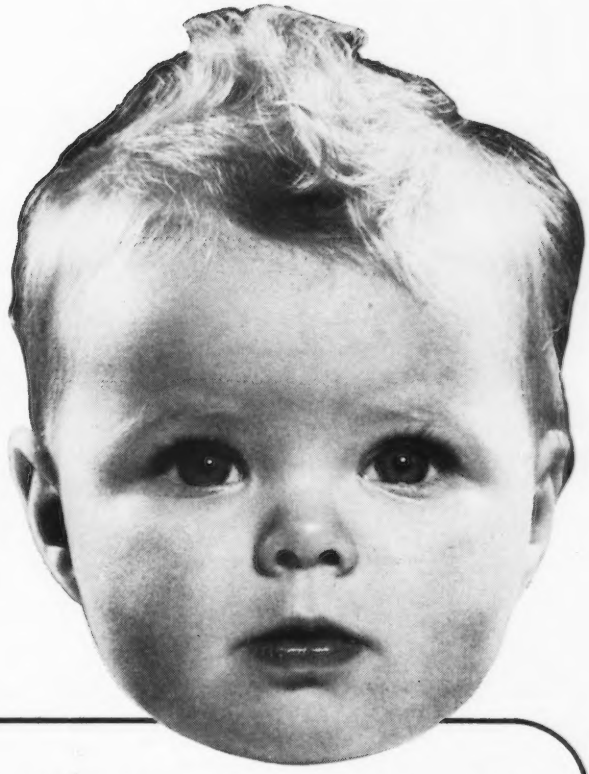
Literature? write Endo®

ENDO PRODUCTS INC.,
Richmond Hill 18, New York

Babies thrive on Loma Linda SOYALAC

A SPRAY DRIED HYPO-ALLERGENIC

Infant Food



SOYALAC is strikingly similar to mother's milk—both in composition and ease of assimilation. A true colloid liquid, SOYALAC looks like milk and has a pleasant milk-like flavor. SOYALAC is the only constituted fibre-free vegetable milk not derived from an animal. Its biologic value protein is obtained from the soy bean. SOYALAC has been used extensively for the past fifteen years. Its chemical and physical characteristics have been thoroughly checked. Clinical data furnish evidence of SOYALAC's ability to promote growth and development.

SOYALAC HAS MANY USES

While non-problem infants thrive on SOYALAC, it is also tremendously beneficial in solving the feeding problems of prematures and infants requiring milk-free diets. Babies like it, and thrive on it.

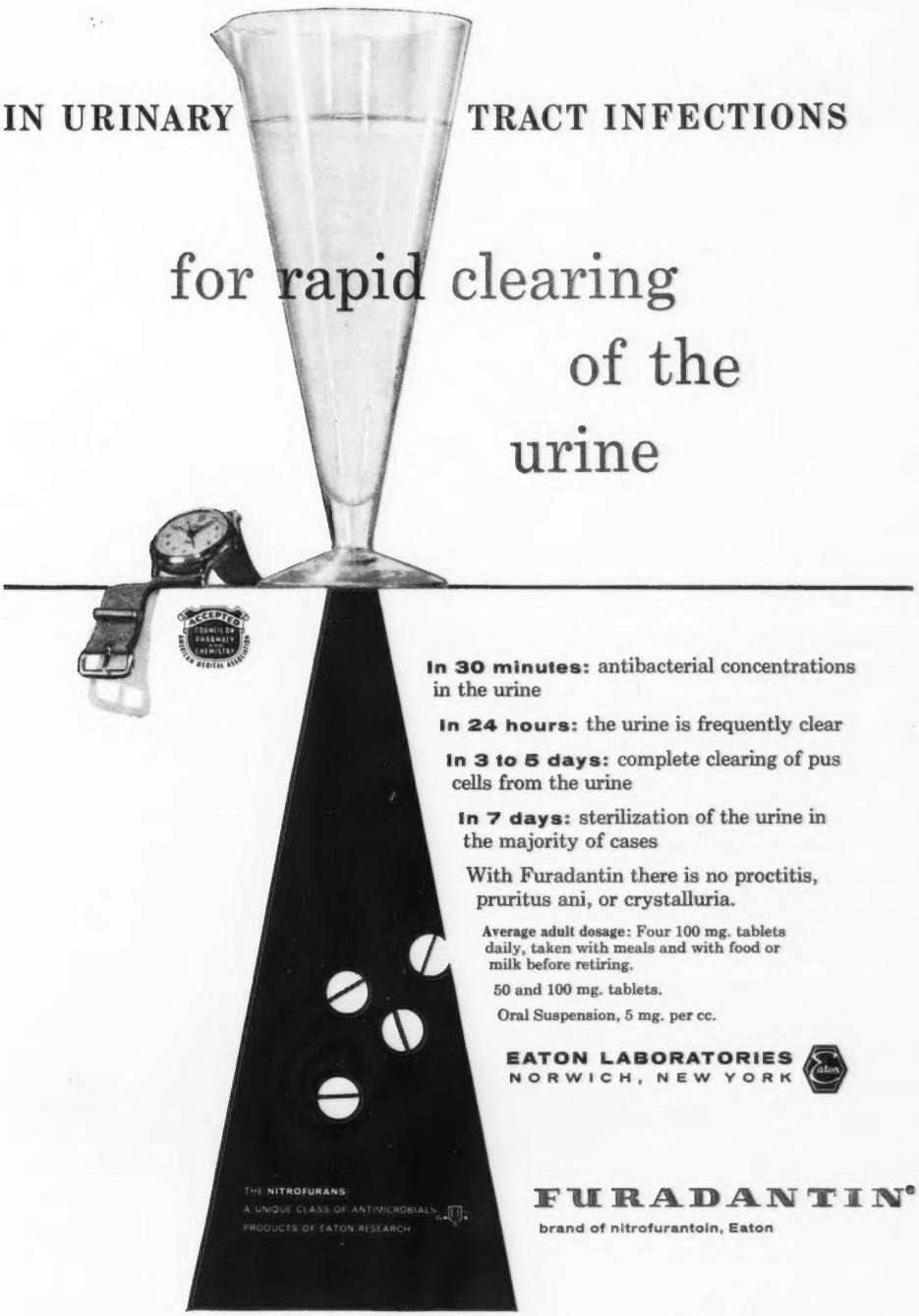
Nursing and expectant mothers allergic to animal milk find SOYALAC a most nutritive beverage. It can be used freely in milk-free diets.

Free Booklet! *Further information on SOYALAC Infant Food is available from Loma Linda Food Company, Arlington, California, or Mount Vernon, Ohio.*

use FURADANTIN first...

IN URINARY TRACT INFECTIONS

for rapid clearing of the urine



In 30 minutes: antibacterial concentrations in the urine

In 24 hours: the urine is frequently clear

In 3 to 5 days: complete clearing of pus cells from the urine

In 7 days: sterilization of the urine in the majority of cases

With Furadantin there is no proctitis, pruritus ani, or crystalluria.

Average adult dosage: Four 100 mg. tablets daily, taken with meals and with food or milk before retiring.

50 and 100 mg. tablets.

Oral Suspension, 5 mg. per cc.

EATON LABORATORIES
NORWICH, NEW YORK

FURADANTIN®
brand of nitrofurantoin, Eaton

Factor in Sudden Death of Infants Suggested

A low level of the natural antibodies that fight infection and disease may possibly account for some sudden, unexpected deaths of infants, three New York scientists recently stated.

They said if the theory could be confirmed by future studies, the routine injection of small amounts of gamma globulin in young infants "might possibly prevent a substantial number of these sudden and unexpected deaths."

The theory was reported in a recent issue of the *Journal of the American Medical Association* by David M. Spain, M.D., Victoria A. Bradess, M.D., and Irving J. Greenblatt, Ph.D., Brooklyn.

It has been estimated that each year several thousand young infants in apparently good health die suddenly and unexpectedly, they said. The usual case is that of an infant one and a half to three and a half months old who is put to bed and found dead several hours later. The deaths are sometimes attributed to accidental mechanical suffocation, imbalance of certain gland chemicals, and various forms of infection, such as pneumonia. The Brooklyn scientists said only a diagnosis of infection appears to have any validity in most cases.

In studying 52 such deaths, the most significant finding was occasional signs of infection, particularly in the respiratory system. The peak incidence was during winter and early spring. Deaths also reached a peak between two and three months of age, the "critical" period when the antibodies given to the baby by the mother before birth wear out and the baby begins building his own antibodies.

These findings suggested that the level of gamma globulin, a protein substance of the blood, might be a factor, since most antibodies are of the gamma globulin type of make-up. Gamma globulin produced from blood plasma has been used against such diseases as measles and epidemic hepatitis. The Brooklyn scientists said they tested gamma globulin levels in five babies who died suddenly, three of them without apparent cause. These three had unusually low GG levels. The other two were normal.

"It is therefore possible that an important factor in the inability of these infants to respond to an infection in the usual way by fighting it with antibodies may be dependent on a deficiency in antibodies as well as gamma globulin," they said. They noted that the number of cases studied was too small for any conclusions, but said if their theory could be confirmed by other studies, routine GG injections might prevent some of these deaths.

American Medical Association Mental Health Meeting Draws Good Attendance

A two-day mental health conference of state and county medical society representatives—the first of its kind ever held—drew an attendance of 75 key people. The meeting, held in A.M.A. headquarters in Chicago, was designed to bring about a closer working relationship between the psychiatrist and the general medical practitioner and other specialists.

Thirty-five state medical associations were represented at the meeting, most of them by chairmen of mental health committees. When the meeting ended, these representatives expressed a unanimous opinion that this type of session should be held each year.

Dr. Leo H. Bartemeier, Detroit, chairman of the A.M.A. Committee on Mental Health and chairman of the meeting, stated at the opening session that "we hope to gather information helpful to at least 20 states which do not have mental health committees."

A wide variety of problems was discussed. Mental health programs as carried on in three states—Virginia, Texas, and Connecticut—were outlined on the opening day. Other subjects covered included the advances made in mental health care, the part psychiatric associations can play locally in cooperating with state and county societies, the neuropsychiatric program of the Veterans Administration, and how the Woman's Auxiliary to the A.M.A. can cooperate with local medical committees on mental health.

The second day's session included an address by Dr. Marvin A. Block, Buffalo, chairman of the A.M.A. Subcommittee on Alcoholism, on the functions of his committee at state and local levels.

The conference rejected a proposal to make alcoholism a reportable disease. To do so, some doctors contended, would discourage alcoholics from seeking help of doctors because they would not want their names listed as alcoholics in public records.

Recommendations, however, included these:

Establish committees on alcoholism in all medical societies, where feasible.

Include proper teaching on alcoholism in medical and other professional schools, and provide postgraduate education on alcoholism in these fields.

Urge cooperative and other medical and hospital insurance plans to accept and treat alcoholism as a disease, and urge hospital authorities to accept persons for treatment as alcoholics.

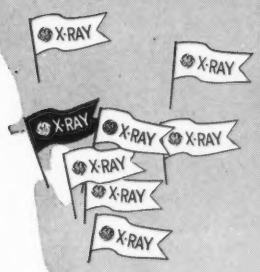
—The A.M.A. Secretary's Letter

Here's a picture of the service for which G. E. X-RAY is famous

...california style

TO serve physicians and hospitals, General Electric X-Ray maintains *two factory-operated district offices and 42 trained sales and service experts in California.* At 14 strategic locations, they're on call 24 hours a day to bring you many extra services you get only from General Electric, including:

- **INSTALLATION PLANNING SERVICE**
- **TECHNICAL SERVICE**
- **EMERGENCY SERVICE**
- **ENGINEERING SERVICE**
- **MAXISERVICE®**
- **SUPPLY SERVICE**



LOS ANGELES —
550 N. Western Ave., L. A. 4,
HOllywood 2-2247
R. L. Bliss, Service
H. R. Case, Service
B. E. Davis, Service
P. A. Hardy, Sales
R. A. Hill, Service Supervisor
W. A. Mayer, Sales
C. H. McMillan, District Manager
A. M. Mendola, Service
F. M. Paroli, Service
R. G. Sinclair, Sales
James Spliitt, Service
D. F. Vonk, Sales
R. D. Westphal, Sales
R. W. White, Sales
D. L. Wolfe, Service

Ontario — YUkon 6-30430
G. W. Primeau, Jr., Service

Riverside — Phone 12368W
C. E. Maxwell, Sales

San Diego —
521 Grape Street
BEImont 2-1434
A. H. Jordan, Sales
C. W. Murphy, Service
L. M. Reaber, Service

SAN FRANCISCO —
1269 Howard Street S. F. 3,
MArket 1-3864
W. D. Cunningham, Sales
S. J. Kolar, Service Supervisor
E. M. Leedham, Sales
A. Molinari, Service
L. M. Rasmussen, District Manager
P. M. Stivender, Service
Harold Vallans, Service
R. J. Wood, Service

Fresno —
Patterson Building,
2014 Tulare Street,
Phone 6-8302
R. J. Bertram, Service
J. P. Lucas, Sales
L. G. Weigart, Sales

Oakland —
TEmplebar 2-2759
L. E. Oskowski, Service
LOckhaven 2-0449
W. J. Sinnott, Sales

Sacramento —
626 Forum Bldg.,
1107 9th Street
GIlbert 3-1789
R. V. Lord, Sales
R. N. Rasmussen, Service
F. W. Spear, Service

San Jose —
CYpress 4-7568
Harold Bobbitt, Service

Stockton —
HOward 2-0166
W. P. Schuler, Sales

Santa Rosa —Phone 6416
F. G. Davis, Sales

Redwood City —
EMerson 6-3127
J. H. Flanagan, Sales

Hayward —
JEfferson 7-8904
M. E. Hunt, Sales

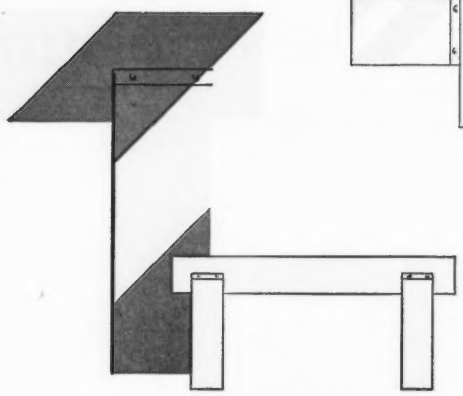
Bakersfield —
FAirview 3-9534
E. S. Trowsdale, Service

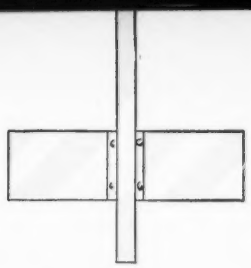
Call G.E. for the finest in x-ray and electromedical apparatus

Call G.E. for prompt expert repairs, everything in supplies

Progress Is Our Most Important Product

GENERAL ELECTRIC





overcoming weight control obstacles

Obedrin®

and the 60-10-70 basic diet

Patients can lose weight and maintain a restricted diet, in comfort, without undesirable side effects . . .

EXCESSIVE DESIRE FOR FOOD

Obedrin offers the full anorexigenic value of Methamphetamine to curb the desire for food, while counteracting mood depression. Patient co-operation is made easier.

NERVOUS TENSION

To avoid excitation and insomnia, Pentobarbital is the ideal daytime sedative. It counteracts over-stimulation by Methamphetamine, but does not diminish the anorexigenic action.

VITAMIN DEFICIENCIES

Obedrin tablets contain adequate amounts of vitamins B_1 and B_2 to supplement the 60-10-70 Basic Diet, but not enough to stimulate the appetite.

EXCESSIVE TISSUE FLUIDS

Large doses of Ascorbic Acid aid in the mobilization of fluids, so often an obstacle in obesity.

BULK NOT NECESSARY

The 60-10-70 Basic Diet provides enough roughage, so artificial bulk is unnecessary. The hazards of impaction caused by "bulk" producers is obviated.

Write For
60-10-70 Diet
Pads, Weight Charts
And Professional
Sample Of
Obedrin

Each tablet contains:

Semoxydrine HCl..... (Methamphetamine HCl)	5 mg.
Pentobarbital.....	20 mg.
Ascorbic Acid.....	100 mg.
Thiamine HCl.....	0.5 mg.
Riboflavin.....	1 mg.
Niacin.....	5 mg.

S. E. MASSENGILL CO.

Bristol, Tennessee

The Milligram that's worth a Kilo.

BELLERGAL
TABLETS

prevent recurrent, throbbing headache – e.g. migraine

RESTORES AUTONOMIC STABILITY

Bellergal*, by inhibiting *all three divisions of the A.N.S.*, corrects the *autonomic-vasomotor-dysfunction*, so preventing recurrent, vascular headaches. According to Hilsinger, autonomic imbalance is a major contributing factor in the recurrent attacks of vascular-type headaches. He recommends Bellergal to "... dampen the effects of the undesirable nerve impulses to the autonomic nervous system."

INTERVAL TREATMENT OF MIGRAINE
SUMMARY OF RESULTS WITH BELLERGAL

AUTHOR	CASES TREATED	IMPROVED	PERCENT
HILSINGER, R. LARYNGOSCOPE 61:296, 1951.	25	20	80
WITTICH, F. ANN. ALLERGY 10:620, 1952.	35	32	92
VON WITZLEBEN, H. J. MISSOURI M.A. 49:486, 1952.	28	26	92
BANKOFF, K., AND KOHRMAN, B. CLIN. MED. 60:264, 1953.	26	24	95

AVERAGE DOSAGE RANGE:
3 to 6 tablets by mouth daily; after a few weeks adjust dosage to individual need.

*Each Bellergal® tablet contains: Ergotamine Tartrate (sympathetic inhibitor) 0.3 mg., Bellafoline (parasympathetic inhibitor) 0.1 mg., and phenobarbital (central and subcortical sedative) 20.0 mg.

BELLERGAL FUNCTIONAL DISORDERS

Sandoz PHARMACEUTICALS

DIVISION OF SANDOZ CHEMICAL WORKS, INC.
HANOVER, N. J. • CHICAGO 2 • SAN FRANCISCO 8

"Watchdog" Guards Hospital Patients

(Continued from Page 38)

high quality for all hospitals. Dr. Gunnar Gundersen, La Crosse, Wis., first chairman of the commission, said recently the program represents "the best thinking and best inspiration" of the five great cooperating groups, and "if our duties are discharged well, the benefits to mankind through our profession, through our hospitals and for our civilization are unreckonable."

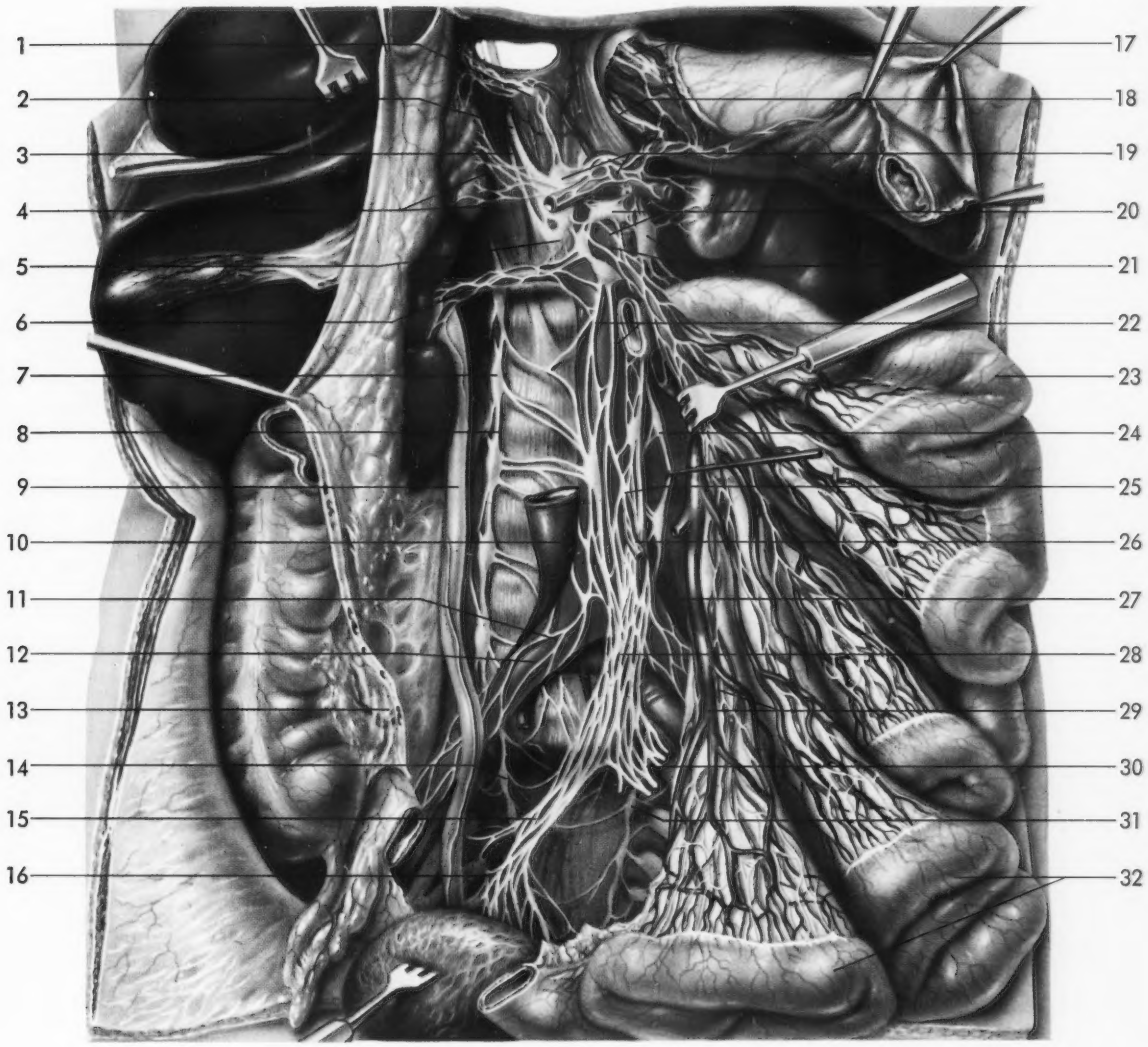
Army Taking 100 Physicians, First in 16 Months

Defense Department has asked Selective Service to call up 550 physicians under the doctor draft for assignments in December. One hundred are scheduled to go to the Army, the first since August 1953. Defense said the Air Force requires 200 and the Navy, 250 physicians. The Department also requested 150 dentists, all for the Air Force.

—A.M.A. Washington Letter

The Sympathetic Nervous System

ABDOMINAL PORTION



1 Phrenic ganglion and plexus
2 Greater splanchnic nerve
3 Lesser splanchnic nerve
4 Suprarenal plexus
5 Aorticorenal ganglion
6 Right renal artery and plexus
7 Right lumbar sympathetic ganglion
8 Right sympathetic trunk
9 Ureter
10 Vena cava
11 Iliac plexus
12 Right common iliac artery
13 Mesocolon (cut)
14 Right sacral sympathetic ganglion
15 Right pelvic plexus
16 Pudendal plexus
17 Left vagus nerve
18 Right vagus nerve
19 Celiac plexus and right celiac ganglion
20 Superior mesenteric ganglion and plexus
21 Left celiac ganglion; superior mesenteric artery
22 Abdominal aortic plexus
23 Jejunum
24 Left lumbar sympathetic ganglion
25 Inferior mesenteric ganglion
26 Inferior mesenteric plexus
27 Left sympathetic trunk
28 Hypogastric plexus
29 Branches of superior mesenteric artery and vein
30 Left pelvic plexus
31 Left sacral sympathetic ganglion
32 Ileum

This is one of a series of paintings by Paul Peck, illustrating the anatomy of various organs and tissues of the body which are frequently attacked by infection, where AUREOMYCIN *may prove useful.*

Women May Travel While Pregnant

Traveling during pregnancy is not likely to be harmful if mixed with "a large dose of common sense."

An editorial in a recent issue of the *Journal of the American Medical Association* said a study of 500 pregnant women at Robins Air Force Base Hospital showed 413, or 82.6 per cent, traveled during pregnancy. The total distance was 817,961 miles, or an average of 1,980 miles a person. Most of it was in the second three months of pregnancy and was largely by automobile. Only a few of the women suffered ill effects.

Travel by present-day means is harmless if care is taken, the editorial said. For example, pregnant women about to begin an automobile trip should plan the itinerary well in advance in order to avoid unnecessary inconvenience. Nourishing meals, short walks, and plenty of rest on the trip are advisable. Medication against air or seasickness should be taken along on plane or boat trips. Long bus or train trips should be arranged to include stopovers. And the possibility of trouble in finding competent medical help during the trip always should be considered, the editorial said.

California MEDICINE

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION

Volume 81 NOVEMBER 1954 Number 5

Differential Diagnosis and Management of Cough

JOSEPH J. FURLONG, M.D., San Francisco

• Cough is a complex defensive reflex whose purpose is protection of the respiratory tract. There are many nonrespiratory causes, particularly pulmonary congestion from heart disease. Coughs may be useful, useless, or harmful. Treatment based on etiology and type of cough requires only a few medications whose efficiency has been demonstrated.

The meaning of cough as a symptom must be carefully determined before rational treatment can be planned. Recent researches on the physiology of the cough reflex, the bronchi, and the mechanisms of bronchial secretion have made it possible for a physician to plan a treatment program on a firm, scientific basis, rather than on tradition.

COUGH IS A SYMPTOM which is so frequently associated with disease of the respiratory tract that physicians may sometimes overlook the fact that cough is actually a complex reflex mechanism, and that the reflex may be initiated by many other causes. While the old descriptions *stomach cough* or *uterine cough* may seem rather fanciful today, nevertheless the terms do emphasize the fact that clinicians who used them recognized that cough frequently originates outside the respiratory tract.

PHYSIOLOGY OF COUGH

The differential diagnosis of cough requires a practical knowledge of the physiology and purpose of the cough reflex. Cough has been described by Jackson as "the watchdog of the bronchial tree" (a description which would seem particularly appropriate in a barking cough). The purpose of cough is to supplement the normal mechanisms of ciliary action and bronchial peristalsis in removing irritants, foreign bodies, excess secretion or exudates from the bronchial tree. A cough that accomplishes these functions is useful and should be encouraged. On the other hand, a cough which is the result of purely reflex action and fails to bring up exudate or secretion is useless and should be checked. It is to be remembered, however, that since many patients, particularly women and children, swallow bronchial secretions as soon as they reach the pharynx, the efficiency of a cough cannot be judged solely by the amount of expectoration.

Cough is a defensive reflex designed to keep the lower respiratory passages clear and to protect them from the entry of foreign material and stagnation of secretions. Ordinarily, these functions are accomplished by the normal physiologic defense mechanisms of the respiratory tract—ciliary action, bronchial peristalsis and the "milking" action of respiratory movements on the bronchi. Cilia are present throughout the trachea and bronchi as far as the terminal bronchioles and have a propulsive rate of about one inch per minute. This ciliary action plus normal secretion is sufficient to keep the air passages

Presented as part of a Panel on Diseases of the Chest before the Section on General Practice at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

clean in health. Rhythmic contraction and dilatation of the bronchial smooth muscle serve to propel these secretions toward the trachea. In addition, respiratory movements cause the bronchi to become longer and wider in inspiration, shorter and narrower on expiration, thus producing a massaging effect on bronchial mucus. All these mechanisms combine to keep the lower respiratory tract free of accumulated secretion or foreign matter. Their effectiveness is shown by the fact that whereas the upper air passages are constantly covered with various bacteria, cultures from the lower tract are normally sterile.

In disease, these normal mechanisms stop or are greatly impaired. In the presence of acute inflammation of the bronchial mucosa ciliary action is destroyed, or rendered ineffective by excessive and tenacious secretions. When the lung is fixed by pulmonary fibrosis, atelectasis or consolidation, the bronchi are unable to dilate and constrict or to elongate and shorten, and secretions tend to accumulate. In these circumstances the watchdog is aroused and cough is induced.

HARMFUL COUGHING

Coughing, particularly when excessive, may of itself be harmful to the patient. The tremendous forces applied to the delicate pulmonary structures during the act of coughing are not sufficiently appreciated. The intrapulmonary pressure may rise above 150 mm. of mercury, or 3 pounds per square inch.[42] The velocity of the column of ejected air ranges from 1 to 5 miles an hour in the respiratory bronchioles to more than 250 miles an hour at the glottis. As Banyai[2] remarked, the speed of a hurricane is about 111 miles an hour. The impact of these forces on the respiratory mucosa tends to damage and irritate them, producing a secondary cough which tends to perpetuate itself. This explains the remarkable instances in which a chronic cough of long duration is cured by a few doses of cough medicine.

Cough is injurious in many other ways. Pulmonary infections, notably pneumonia and tuberculosis, may be spread within the lung by coughing due to dissemination of infectious bronchial emboli. Similarly, the risk of contagion is greatly increased because of the greater dissemination of infected droplets of sputum.[29] Persistent cough interferes with rest, may initiate vomiting or pulmonary hemorrhage, or lead to myocardial failure due to the rise in intrapulmonary pressure which interferes with pulmonary circulation and contributes to right heart strain. Chronic cough, particularly when associated with varying degrees of bronchial obstruction, may lead to bronchiectasis and hypertrophic emphysema due to weakening and rupture of the elastic fibers of the lung. Severe or paroxysmal cough may produce spontaneous pneumothorax from rupture of an emphysematous bleb or subpleural tubercle, or may cause multiple rib fractures. Cough may precipitate syncopal attacks resembling epilepsy,[31] many instances of which are recorded in the literature.

The most common point of origin of the cough reflex is a stimulus to the branches of the superior laryngeal nerve in the laryngeal area.[17] It also originates from vagal afferent fibers in the bronchial mucosa, especially at points of bifurcation. Other afferent nerves are located in the pharynx, pleura, external ear, through Arnold's branch to the canal, and from abdominal viscera, especially from the undersurface of the diaphragm through the phrenic nerve. While it is true that cough originates in the respiratory system in more than 90 per cent of cases, these other afferent pathways must not be forgotten. Sensitivity varies in different parts of the respiratory tree, being most marked in the larynx and at the tracheal bifurcation, and gradually diminishing peripherally, so that secretions in the lower tubes may not excite cough until a change in position brings them in contact with the more sensitive mucosa at the bifurcation of a bronchus.

The cough center is located in the medulla, and it coordinates the complex muscular movements involved in the act of coughing. It is closely related to the vomiting center, thus explaining why violent coughing may terminate in vomiting. Since the cough center is also under voluntary control, a painful cough, as in pneumonia, may be cut short by the patient. Similarly, cough may also be produced voluntarily and become a nervous habit.

The establishment of tolerance must also be borne in mind. Development of tolerance may lessen or obliterate the reflex sensitivity of the cough excitation areas. Illustrative of the development of tolerance is the phenomenon in laryngeal intubation, in which, after a time, the continued presence of the tube does not cause coughing, and in bronchoscopy, where the bronchoscope may be kept in contact without exciting cough unless new mucosal areas are stimulated. In disease the development of tolerance is of considerable importance in connection with foreign bodies, which may not excite cough after the initial paroxysms, and in bronchiectasis, where large amounts of retained secretions do not cause cough until a change in posture brings them in contact with new mucosal areas.

THE THREE PHASES OF COUGHING

The act of coughing has three distinct phases. In the first, or inspiratory phase, the chest becomes dilated through the action of the intercostal muscles, the rib elevators, the accessory respiratory muscles and descent of the diaphragm. The lung becomes loaded with air. In the second or compressive phase there is a short, sudden expiratory movement during

which the glottis is kept closed. Pressure in the lung may exceed 150 millimeters of mercury, and pressure in the great vessels is raised. In the final, or expulsive phase, the glottis is slightly opened while expiration is maintained, allowing the forceful expulsion of the previously compressed air.

In the first phase the intrapleural pressures become strongly negative, forcing the lung to expand if it is able, thus diminishing intrapleural negativity. If the bronchus is obstructed so that air cannot enter, or if the lung is atalectatic or fibrosed so that it cannot expand, the intrapleural pressure will be more negative on the affected side.

In the compressive phase the sudden contraction of the expiratory muscles, chiefly abdominal, decreases chest capacity. The glottis being closed, the lungs are greatly compressed and the intrapleural pressures become highly and equally positive. This phase has been described by Farber[23] as the "tussive squeeze" which tends to milk the bronchi of secretions.

In the expulsive phase intrapulmonary pressure rapidly drops until it equals the atmospheric pressure, when expulsion ceases. In the case of a diseased lung, with bronchial obstruction, atelectasis, retained secretions and infection, the peripheral bronchial walls are weakened and tend to dilate, while the proximal normally drained bronchi are narrower than the peripheral ones, due to the retention of elasticity and tonus and due also to reflex constriction from the local irritation of an inflammatory process in their neighborhood. The demarcation between the healthy and diseased portions of the bronchi thus appears as a relative stricture.

In the first phase, both the healthy and the diseased bronchi are filled with air as the bronchi dilate on inspiration. If filling is incomplete on the diseased side, the higher negative intrapleural pressure tends to exert a dilating force on the weakened bronchial walls. In the compressive phase the intrapleural pressures are equalized. In the expulsive phase, which is the most important, air rushes out of the healthy bronchi easily, but in diseased areas the relative narrowing impedes egress, so that when the pressure in healthy portions of the bronchi has fallen to atmospheric, in the diseased bronchi it is still high, which leads to gradual and progressive dilatation of the diseased portions. Thus cough itself is a factor in the production of bronchiectasis.

CLINICAL ASPECTS

In considering the clinical aspects of cough, it is well to stress that it is so common a complaint that it often attracts little attention, especially when it is nonproductive and not associated with hoarseness, fever or pain in the chest. Yet cough of that kind may be the first warning of such diseases as bronchogenic carcinoma or tuberculosis. Since the habit of smoking cigarettes is so universal,[25, 26, 37, 41] most persons will assume that a dry cough is a "cigarette cough" and pay little attention to it. This is a term which should always be suspect. (The vast majority of patients observed by the author in a period of five years at a large tuberculosis sanatorium had attributed cough to smoking until the onset of fever or hemoptysis led to the establishment of the correct diagnosis). True "cigarette cough" is dry, is frequently described as "morning cough" and is often associated with chronic granular pharyngitis. The danger of attributing such a cough to the irritation of smoking is well illustrated by the high degree of correlation demonstrated by Graham between prolonged and heavy use of cigarettes and the incidence of bronchogenic carcinoma. Patients whose histories would be most suggestive of cigarette cough are the very ones most likely to have bronchogenic carcinoma.

DIAGNOSTIC KEYS

Considerable help in the diagnosis of cough can be obtained by questioning the patient. The duration of cough is very important. A cough of recent origin would more likely represent upper respiratory tract infection, while cough that had persisted for some weeks would indicate the probability of more serious disease. A morning cough would suggest excessive smoking, or the nocturnal drainage of secretions from an infected sinus into the bronchi—the sinobronchial syndrome. The development of cough, particularly with expectoration on change of position, notably when lying down at night or arising in the morning, would suggest the accumulation of secretions in bronchiectatic cavities or lung abscess. An occupational history might reveal exposure to dusts or irritating fumes. Cough that occurs seasonally or only in particular environments would suggest allergic disease. Cough on exertion would lead to suspicion of myocardial insufficiency and congestive failure.[19] The association of cough with whooping or vomiting would suggest whooping cough or lodgement of a foreign body. Association with wheezing would suggest asthma or foreign body.

All this information as to the duration of a cough and the circumstances associated with its onset are helpful clues to the correct diagnosis; but by far the most important questions in connection with a cough are: "Do you bring anything up?" and "What do you bring up?" The association of cough with expectoration makes accurate diagnosis easier, since the character and content of the sputum itself will often indicate the correct diagnosis. Therapeutic considerations, too, are considerably different as between productive and nonproductive cough.[22]

NONPRODUCTIVE COUGH

A nonproductive cough is the result of reflex action produced by an irritant which the cough itself is unable to remove. Such a cough may arise from the following causes and sources:[38, 43]

1. The external ear. Impacted cerumen or foreign body.

2. The nose. Nasal obstruction, with mouth breathing, causes cough that is worse at night. Chronic paranasal sinusitis[15, 32] is one of the most frequent causes of chronic cough, both reflexly and especially when associated with postnasal drip and the sinobronchial syndrome.

3. The pharynx and larynx. Excessive smoking or drinking, overuse of the voice. Tuberculosis or carcinoma of the larynx. Laryngitis.

4. Mediastinal compression of the trachea, by aneurysm, tumor or enlarged hilar lymph nodes.

5. Bronchogenic carcinoma.

6. Early tuberculosis.

7. Pulmonary congestion from cardiac disease, especially mitral stenosis or left ventricular failure.

8. Worms. The embryos of ascaris and oxyuris pass through the lungs in the course of their developmental cycle and may cause a puzzling cough.

9. Nervousness. Cough may be produced voluntarily and become a nervous habit. Like sighing, it may be manifestation of anxiety rather than disease.

It is quite generally recognized that a dry cough is frequently an early manifestation of pulmonary tuberculosis, and that an x-ray film of the chest may reveal extensive parenchymal changes at a time when no abnormalities can be detected on physical examination. It is not so generally appreciated that a dry cough may be the earliest and, indeed, the only symptom of bronchogenic carcinoma at a time when no abnormality is visible in x-ray films. By the time diagnosis is finally made, all too often review of the clinical history will show a period of several months of symptoms, predominantly cough, during which time the patient was treated symptomatically for bronchitis or only advised to stop smoking. This low level of clinical suspicion is partially responsible for the lag between the onset of symptoms and correct diagnosis, for the inoperable stage that is reached in so many cases, and for the poor results of operation measured in terms of five-year arrest. A dry cough, particularly in a male, and especially in a heavy smoker, should call for immediate suspicion and the fullest study to make sure carcinoma is not present.

The importance of the cardiovascular system in the genesis of cough must be stressed.[19, 21] Cough may be an early and predominant symptom of cardiovascular disease. Pulmonary congestion resulting from rheumatic heart disease with mitral stenosis or from hypertensive, coronary or syphilitic heart disease with left ventricular failure, is the most common cause. Cough so caused may be initiated or aggravated by exertion, but often is nocturnal. Aneurysms, congenital vascular rings and pericardial effusion may cause cough. Pulmonary embolism, so frequent in cardiac disease, may cause cough, often associated with hemorrhagic sputum.

The condition of the tracheal and bronchial mucosa greatly influences the sound of a cough.[17] Congestive catarrhal conditions of the pharynx produce a dry, hacking cough, frequently repeated. With laryngeal involvement a harsh, hoarse croupy cough is produced. When the vocal cords are destroyed, as in tuberculosis or neoplasm, the cough becomes toneless, whispering, aphonic. When a cord is paralyzed as in conditions which cause pressure paralysis of the left recurrent laryngeal nerve, especially thoracic aneurysm, the classic brassy cough results.

When cough is accompanied by expectoration, diagnosis is made much easier, for the character and content of the sputum are of great assistance. In acute pulmonary infections bacteriological examination will determine the infecting organism. Sensitivity tests on organisms recovered from culture of the sputum will indicate the antibiotic of choice, which may be life-saving. In tuberculosis the demonstration of acid-fast bacilli in the sputum not only is the best means of establishing the presence of active disease but helps determine the effectiveness of therapy. In connection with the disease it is particularly important to bear in mind that many patients swallow bronchial secretions as soon as they reach the pharynx and do not spit them out. In such cases bronchial secretions can be recovered by gastric lavage. The significance of growth of acid-fast bacilli on a culture of gastric material is exactly the same as that of a "positive" culture of sputum; it always indicates active disease.[24] Since pus is a factor common to all inflammation of mucous membranes, its mere presence is of little diagnostic value, although the quantity, color and odor of pus may be suggestive.

The daily volume of sputum may be readily determined. The expectoration of large amounts of foul-smelling sputum that settles in three layers is characteristic of advanced bronchiectasis. A decrease in the volume of sputum in a 24-hour period would indicate a favorable response to treatment. The tenacious, bloody sputum typical of acute lobar pneumonia and the gelatinous sputum containing eosinophils, Curschman spirals and Charcot-Leyden crystals typical of asthma are easily recognized.

TREATMENT OF COUGH

The treatment of cough is primarily a problem of determining and treating the cause. In many cases, however, treatment must be directed toward reliev-

ing the symptom itself, either because the cough is ineffective and useless or actually harmful, or because the cause cannot be eliminated. Here the basic principle must be to reduce the force and frequency of the cough to a minimum compatible with the adequate evacuation of the respiratory tract.[2] Cough remedies have been described[34] as inheritances of folklore. Certainly the prescription of a cough syrup[6, 9] frequently represents the last vestige of polypharmacy in therapeutics. It must be obvious from the complex nature and etiologic vagaries of cough that there can be no such thing as a good all-purpose cough remedy. From the previous discussion of the physiology of the cough reflex it will be evident that there are four distinct points of attack in treating cough: The cough center, the peripheral reflex sensitivity, the bronchi and the bronchial secretions.

Routine prescription of a cough sedative, usually a narcotic, to check a cough, is to be deprecated.[13,29,40] Only a useless, nonproductive cough should be so treated, since depressing the cough reflex may be very harmful if the cough is successfully draining the bronchial tree of infected secretions. Codeine is most commonly prescribed and, in the doses generally used (8 mg. to a teaspoonful of vehicle) seldom causes undesirable side effects, constipation and drowsiness.[18] In especially sensitive patients dihydrocodeinone bitartrate[30] or caramiphen ethanedisulfonate[39] may be substituted. The efficacy of codeine as a cough sedative is not universally accepted. In one study[20] a dosage of 10 mg. was found as effective as the 30 mg. formerly used. Another investigator[28] found no evidence that codeine by mouth even in doses of 0.2 gm. has anything more than a psychological effect. There is general agreement that while heroin is the most effective antitussive agent,[28] the danger of addiction is too great for clinical use. Many investigators feel the same objection applies to the use of morphine or dihydromorphinone (Dilaudid) while others[18] point out that the dosage of morphine required is so small (about 2 mg.) that undesirable side effects are not produced and the danger of addiction is nil. In dealing with cough caused by malignant tumor or by mediastinal compression from aneurysm, the more powerful sedatives, Dilaudid or morphine, may be required in increasing doses.

Measures to control peripheral reflex hyperirritability include the soothing demulcent action of syrups and cough-drops on the irritated mucosa of the pharynx, the use of lozenges containing ethylaminobenzoate, and the use of phenobarbital. Recently the addition of antihistamines to cough mixtures on the basis of their sedative action has been suggested, but this seems hardly justifiable except in cases in which an allergic factor is demonstrable.[12]

The usefulness of bronchial dilators in asthma is well known, particularly aminophylline and ephedrine or various synthetic variations of ephedrine. In many cases of bronchitis, particularly viral bronchitis of the wheezy type so commonly seen in the San Francisco Bay area, the administration of aminophylline and ephedrine, usually combined with phenobarbital, brings about bronchial dilatation, relieves wheezing and dyspnea, improves bronchial drainage and controls cough.

ALTERING BRONCHIAL SECRETIONS

There are many substances that are supposed to act by altering the amount or character of the bronchial secretions. Recent experimental work, however, has cast considerable doubt on the effectiveness of many of these preparations, particularly in the doses usually employed clinically.[1, 29, 44] An attempt to change bronchial secretions is indicated if the cough is tight and the volume of secretions deficient or if the cough is loose and secretions excessive.

In a tight cough with scanty sputum, the most useful medication is water.[22] The patient should be encouraged to take fluids and fruit juices freely; each dose of cough medicine should be prescribed with a full glass of water; the air of the sick-room should be kept saturated with water vapor; and steam inhalations should be prescribed, either plain or with the addition of a suitable aromatic substance such as tincture of benzoin, menthol, turpentine or oil of pine. It is probable that the benefit is derived chiefly from the steam itself, and that the aroma makes the procedure more pleasant and has psychological benefit. There is some evidence that the inhalation of aromatic fumes may reflexly increase bronchial secretions. The use of expectorants is often disappointing and uncertain, and yet, to quote Forcheimer, "We should be very sorry to be without them." The object is to further the productivity of the cough by increasing the secretions of the bronchial tree. Any increase in the fluid in the respiratory tract would facilitate discharge of mucus or exudate by making it less sticky, would increase the continuous upward streaming of secretions, and by forming and maintaining a protective film over the membranes would tend to decrease activation of the afferent nerve endings and initiation of the cough reflex.

Expectorant action may be exerted in three ways: (1) A gastric reflex mediated through the vagus to the medulla and thence to the secretory cells of the bronchial mucosa; (2) direct stimulation of a secretory center in the medulla, and (3) direct action on the secreting cells. While it seems probable that all three modes of action may be involved to varying degrees with various expectorants, the studies of Boyd[5, 7, 8, 10, 11] showed that the stimulation of a gastric reflex is particularly important. Boyd[33] devised

a method of directly measuring the quantity of bronchial secretion in experimental animals by means of a T-tube in the trachea. He introduced various drugs into the stomach and measured the effect on the quantity of respiratory tract fluid. He demonstrated that the commonly used expectorants do augment the output of respiratory tract fluid to a maximum between 100 and 200 per cent. Among the preparations studied were ammonium chloride, which increased fluid output by 88 per cent; potassium iodide, 150 per cent; terpin hydrate, 96 per cent; guaiacol, 78 per cent. Glycerol guaiacolate, an ether of guaiacol, which recently became commercially available, increased the output 185 per cent. Further study of this preparation would seem to be warranted.[14, 16] Stimulation of the cervical sympathetic nerve had little effect, while stimulation of the cervical vagus stump increased the output by 200 to 300 per cent. Further studies with cholinergic drugs showed that all of them would increase bronchial secretion, some more than tenfold. While the side effects of these drugs in the forms available today might be undesirable in a cough medicine, synthetic modifications having pronounced expectorant properties with few undesirable actions may be developed. When the gastric nerves were sectioned, effectiveness of expectorant drugs was much reduced, a fact that is indicative of the importance of the gastric reflex. This would also explain the ineffectiveness of enteric-coated ammonium chloride for this purpose, as was pointed out by Beckman. As iodides are irritant, they are contraindicated in acute inflammation. They are used when secretion is tenacious and difficult to dislodge, and are most effective in bronchiectasis and in asthma and asthmatic bronchitis.[27] They are readily prescribed as the saturated solution of potassium iodide, 15 to 25 drops three times a day in water.

When a cough is excessively loose, terpin hydrate is the agent of choice. The usual elixir of terpin hydrate contains so little, slightly over 60 mg. per teaspoonful, that it serves only as a vehicle. When the stimulant expectorant effect is desired it is best prescribed in 0.3 gm. capsules four times daily. In the chronic productive cough of bronchiectasis and chronic bronchitis, postural drainage or aspiration of excess secretions through a bronchoscope, followed by instillation of iodized oil, often serves to reduce the excessive cough and expectoration.

STIMULUS FOR WEAK COUGH

In some circumstances a cough may be too feeble to accomplish its object and increased coughing may be needed to clear the chest of secretions. This may be accomplished by encouraging the patient to cough voluntarily, by frequent change of posture, and by pharyngeal irritation to stimulate the cough reflex. Voluntary deep breathing is also helpful, and if voluntary measures are unsuccessful the inhalation of concentrations of 5 to 10 per cent carbon dioxide in oxygen serves as a powerful respiratory stimulus to bring about respirations sufficiently deep to get beyond the accumulating secretions.[2, 3] It is obvious that all liquefying expectorants and cough sedatives are contraindicated. Continuous pharyngeal and laryngeal suction is very effective in removing the excess secretion, and may prove life-saving. Since the experiments of Boyd also showed that the increased amount of respiratory tract fluid produced by cholinergic agents was eliminated by atropine, the use of the drug would be indicated whenever bronchial secretion is excessive, although clinically its use is often disappointing, perhaps because bronchial secretion is partially the result of direct stimulation of the bronchial glands and is not mediated through vagal pathways.

384 Post Street, San Francisco 8.

REFERENCES

1. Alstead, S.: Drug therapy in bronchitis, Practitioner, 158:149, 1947.

2. Banyai, A. L.: Modern concept of the management of cough, Marquette Med. Rev., 11:1, Dec. 1945.

3. Banyai, A. L.: Management of cough in daily practice, J.A.M.A., 148:501, 1952.

4. Barach, A. L., Bickerman, H. A., and Beck, G.: Advances in the treatment of nontuberculous pulmonary disease, Bull. N. Y. Acad. Med., 28:353, June 1952.

5. Boyd, E. M., and Ronan, A. K.: Excretion of respiratory tract fluid, Am. J. Physiol., 135:383, 1942.

6. Boyd, E. M.: The cough syrup, Brit. M. J., 2:735, 1946.

7. Boyd, E. M., and Lapp, M. S.: Expectorant action of parasympathomimetic drugs, J. Pharm., 87:24, 1946.

8. Boyd, E. M., Machlachlan, J.: The expectorant action of paregoric, Can. M. A. J., 50:338, 1944.

9. Boyd, E. M., Palmer, B., Pearson, G. L.: Is there any advantage in combining several expectorant drugs in a compound cough mixture? Can. M. A. J., 54:216, 1946.

10. Boyd, E. M., Pearson, G. L.: Expectorant action of volatile oils, Am. J. Med. Sci., 211:602, 1946.

11. Boyd, E. M., and Buell, M.: Methadone and respiratory tract fluid, Can. M. A. J., 63:588, 1950.

12. Boyd, E. M.: Cough medication and antihistamine drugs, Can. M. A. J., 67:289, 1952.

13. Brockbank, W.: Principles governing treatment of cough, Clin. J., 78:138, 1949.

14. Cass, L. J., and Frederik, W. S.: Comparative clinical effectiveness of cough medication, Am. Pract. and Digest of Treatment, 2:844, 1951.

15. Clerf, L. H.: Cough as a symptom, Med. Clin. N. A., 31:1393, Nov. 1947.

16. Connell, W. F., Johnston, G. M., and Boyd, E. M.: Expectorant action of Resyl (glyceryl guaiacolate and other guaiacols), Can. M. A. J., 42:220, 1940.

17. Coope, R.: Diseases of the Chest, 2nd ed., Williams & Wilkins Co., 1948.

18. Cornell Conference on Therapy: The treatment of cough, Am. J. Med., 14:87, 1953.

19. Currens, J. H.: Importance of cough in cardiovascular disease, Bull. N. E. Med. Cent., 10:84, April 1948.

20. Davenport, L. F.: Pub. Health Rep., Wash., Suppl. No. 158, p. 61, 1940.

21. Diagnosis and Treatment of Chronic Cough, A Symposium, Med. J. Australia, 2:487, 1952.

22. Fantus, B. J.: The treatment of cough, J.A.M.A., 106:375, 1936.

23. Farber, S. M.: Recent advances in diagnosis and treatment of diseases of the chest, Oral Surg., 3:889, 1950.

24. Furlong, J. J., and Warren, M. K.: Gastric lavage in the control of treatment of pulmonary tuberculosis, Am. J. Med. Sci., 204:674, Nov. 1942.

25. Greene, B. A., and Berkowitz, S.: The preanesthetic induced cough as a method of diagnosis of preoperative bronchitis, Ann. Int. Med., 37:723, Oct. 1952.

26. Greene, B. A., and Berkowitz, S.: Tobacco bronchitis, an anesthesiologic study, Ann. Int. Med., 40:729, April 1954.

27. Herxheimer, H., and McAllen, M. K.: Potassium iodide in cough mixtures, Lancet, 1:1213, 1952.

28. Hillis, B. R.: The assessment of cough-suppressing drugs, Lancet, 1:1230, 1952.

29. Hobby, A. W.: Cough; its pathology, therapy, and management, Dis. of Chest, 22:196, Aug. 1952.

30. Hyman, S., and Rosenblum, S. H.: Clinical evaluation of a new antitussive agent, Ill. M. J., 104:257, Oct. 1953.

31. Kerr, A., and Derbes, V. J.: The syndrome of cough syncope, Ann. Int. Med., 39:1240, Dec. 1953.

32. Mayer, E., and Rappaport, I.: Chronic cough and expectoration, N. Y. Med., II, 3:19, Feb. 5, 1946.

33. Perry, W. F., and Boyd, E. M.: A method for studying expectorant action in animals by direct measurement of the output of respiratory tract fluids, J. Pharm. and Exper. Ther., 73:65, 1941.

34. Reimann, H. A.: Viral infections of respiratory tract, J.A.M.A., 132:487, 1946.

35. Rose, I.: The ineffectiveness of expectorants, Can. M. A. J., 69:494, Nov. 1953.

36. Schmidt, H. W.: Pulmonary dyspnea, Proc. Staff Meet., Mayo Clinic, 27:54, Jan. 30, 1952.

37. Scott, R. B.: Some medical aspects of tobacco smoking, Brit. M. J., 1:671, Mar. 25, 1952.

38. Skilling, O. M.: Differential diagnosis of the conditions which produce cough and hemoptysis, Clinics, 2:1460, 1944.

39. Snyder, G. G.: An evaluation of caramiphen ethanedisulfonate (Toryn) as an antitussive agent, Laryngoscope, 63:1008, Oct. 1953.

40. Treatment of Cough, editorial, Lancet, 1:24, 1189, June 13, 1953.

41. Waldblott, G. L.: Smokers' respiratory syndrome, a clinical entity, J.A.M.A., 151:1398, April 18, 1953.

42. Whittenberger, J. L., and Mead, J.: Respiratory dynamics during cough, Trans. Nat. Tuberc. Assn., 48:414, 1952.

43. Wilson, J. L.: Chronic cough, hemoptysis, thoracic pain and dyspnea, Med. Clin. N. A., 36:333, March 1952.

44. Young, R. A.: Modern therapeutics, X. Expectorants and linctuses, Practitioner, 144:433, 1940.

Iron Therapy in Pregnancy

A Comparative Study of Various Modes

ROBERT W. DEVOE, M.D., San Leandro, and LINCOLN E. MOSES, Ph.D., Menlo Park

• Study was made of groups of pregnant patients who were given various hematinic agents from the seventh month of gestation to term.

Dilute hydrochloric acid given with meals in usual doses produced no appreciable increase in the hemoglobin concentration, erythrocyte count or packed cell volume. Iron therapy in the form of orally administered ferrous sulfate, or orally administered ferrous sulfate-molybdenum oxide, or as intravenously administered saccharated iron oxide had a beneficial effect on these three factors in the blood.

INTEREST IN THE STUDY of anemia in pregnancy probably began more than a century ago with the publication of *Notes on Anhæmia* by Walter Channing.[2] He reported the first case which ended fatally and noted in the anamnesis that the patient had been eating a diet adequate in meats, juices and decoctions of meat as well as alcoholic and vinous stimulants. Inasmuch as food was well digested and the appetite remained good, iron therapy, although considered, was believed unnecessary, he reported. Symptoms of the various organ systems of the body were well outlined in the report, especially those concerning the circulatory and respiratory systems. It was noted that the blood was changed, being pale, and "that material which colored the blood, especially the red globules, was changed or more or less wanting. It is more liquide, coagulates but slightly or not at all, hence the composition, its chemical elements or their relations, have undergone changes of some sort. The blood was thin and watery, pale, with soft or no coagula. It resembles somewhat the blood which escapes at length from a wound which cannot be closed, as from pulling a tooth, cutting the gums, etc., in hemorrhagic persons. Yet the blood in anhæmia has its differences from this. In its cause it especially has these, for it is not a state induced by hemorrhage." Increased blood volume in pregnancy was hinted by Channing, for some of his patients were treated by blood letting and the "blood burst from the orifice with violence" and the small veins became large and of "bright arterial color." Transfusion was considered "if safe in itself" but "what possible benefit would such a supply of blood be?"

The seemingly neglected importance of adequate gastric secretion in pregnancy was reported in 1932 by Strauss and Castle[12, 13] in two publications. Groups of patients were subjected to monthly gastric analysis and it was found that there was decreased secretory power of the gastric mucosa in pregnancy and the cause of the decrease was unknown. Eighty per cent of the patients studied had higher concentrations of hydrochloric acid in the gastric juice after delivery than during pregnancy, and the amount was about three times as great as during the sixth month of gestation. A relationship of hemoglobin levels to the adequacy of diet and to the content of hydrochloric acid in the third trimester was noted. Although the hemoglobin levels were generally low, patients with adequate diet and 15 cc. or more of one-tenth normal hydrochloric acid had the highest levels, and patients with achlorhydria and inadequate diet had the lowest. The anemia resembled that of gastrointestinal disturbances, poor diet and loss of blood.

Hamilton, Higgins and Alsop[8] found the use of hydrochloric acid to be of value in treating patients who did not respond to the administration of iron by mouth. Seventy-four per cent of the patients in a series reported upon by them responded well when given iron orally; and when those who did not benefit were given hydrochloric acid as well, the total number with favorable response was increased by another 10 per cent.

The most widely recommended iron preparation for use in hypochromic anemia is ferrous sulfate U.S.P. The dosage needed is smaller than that of reduced iron or ferric salts, and the average dose is 1 gm. daily in divided portions. Occasionally it is ineffective and now and again disagreeable and variable gastrointestinal side-effects develop.[7]

In recent years there has been an almost precipitous rise in the use of iron compounded with other metals for hematinic purposes. Ferrous sulfate processed with molybdenum oxide in tablet form has been favorably reported upon in the literature. Talso and Dieckmann[14] in 1948 reported that various iron

From the Department of Obstetrics and Gynecology, Providence Hospital, Oakland, and Stanford University School of Medicine, San Francisco (De Voe); and the Department of Public Health, Stanford University School of Medicine (Moses).

Presented before the Section on Obstetrics and Gynecology at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

salts did not produce significant elevation in hemoglobin concentrations. However, in 1949, Dieckmann and Priddle,[4] noting the favorable results of Healy and Neary in the use of iron-molybdenum complex employed it in their clinic. Subsequently they reported their impressions concerning the use of this material in pregnancy[5] and found that the rise in hemoglobin was so dramatic that at first it was thought the patients might have a decrease in plasma volume, although this impression was discarded upon further deliberation.

In recent years iron preparations that are effective when given intravenously have become available. Nicholson and Assali[10] observed a favorable response to the use of saccharated iron oxide in anemic pregnant patients, and noted the response was greatest in the cases in which anemia was greatest. Kartchner and Holmstrom[9] used iron intravenously with positive results in patients who could not otherwise receive iron or who registered for care so late in pregnancy that therapy with iron by mouth would not be effective. Hamilton, Higgins and Alsop[8] used iron oxide intravenously in a large series of patients and observed favorable response. They also noted several side effects and in some instances felt justified in terminating the therapy.

According to Eastman[6] the increase in the total volume of blood in gestation approximates 30 per cent, the increase in plasma volume is about 40 per cent, and the increase in red cell volume is about 20 per cent. It can be surmised from this that there is a concurrent decrease in the hematocrit reading. The increase in plasma volume has been attributed to hydremia. Frequently in pregnancy anemia is simulated, with relative reduction of packed cell volume, of erythrocyte content and of hemoglobin content. This condition has been called "pseudoanemia," for actually the volume of erythrocytes is increased by 20 per cent. The diagnosis of anemia in pregnancy, according to Eastman, should be made only if the erythrocyte content falls below 3.25 million per cu. mm., the hemoglobin level below 10 gm. per 100 cc., and the packed cell volume below 30 per cent of the whole blood. According to Talso and Dieckmann[14] there is a 25 per cent increase in plasma volume during pregnancy, but the erythrocyte count increases only 23 per cent, the disparity bringing about "physiologic anemia."

The reported "standard values" for hematologic factors in peripheral blood vary somewhat, depending on the authority, but in general there is fairly close agreement as to standards. Talso and Dieckmann used as standard values a hemoglobin level of 10 gm. per 100 cc. of blood, a packed cell volume of 33 per cent of the whole blood and an erythrocyte content of 3,360,000 per cu. mm. of blood. They also noted that errors in hemoglobin determinations were 7 to 15 per cent, that errors in erythrocyte count were about 8 per cent, and that the error in packed cell volume determinations was only 2 per cent. Wolff and Limarzi[15] established values of 10 gm. of hemoglobin per 100 cc. of blood, erythrocyte content of 3,500,000 per cu. mm. and packed cell volume of 30 per cent.

Benstead and Theobald[1] observed that normal values were maintained if patients were given therapeutic doses of iron during pregnancy, and also that ferrous sulfate or ferrous sulfate-molybdenum oxide complex given during the last trimester produced a recovery from anemia and a maintenance of values to term.

The therapy of choice varies. Some investigators have reported that ferrous sulfate is as adequate as any form[1] while others have expressed belief that ferrous sulfate-molybdenum oxide complex is necessary.[3, 5] Hamilton, Higgins and Alsop[8] reported that the addition of hydrochloric acid to the intake of ferrous sulfate-molybdenum oxide complex brought about favorable response in the levels of blood components. Lund advocated the addition of vitamin C as a hematinic because it aids in the absorption of iron. Recently many investigators[8,9,10] have reported that administration of saccharated oxide of iron has produced remarkable improvements in the condition of peripheral blood of anemic pregnant patients.

The current prevalent practice is to administer iron alone or in some combined form during pregnancy. Some obstetricians give it throughout pregnancy without doing laboratory studies on the peripheral blood, while others carefully and frequently determine the condition of the blood and use iron only if indicated. Probably the majority of physicians use iron preparations for all or part of the pregnancy and examine the blood periodically only if there is clinical indication of anemia. One of the authors (R.W.D.) long maintained that the routine administration of iron by mouth during pregnancy was of little or no value because of the various factors involved in "pseudoanemia" as previously mentioned, and did not employ any form of iron intake with the exception of that ingested in the diet. This opinion was not isolated, as other practitioners felt also at one time that supplementation of the diet by iron salts was of slight or no value.[4]

Accordingly a study was begun to test the opinion that the routine use of iron therapy in pregnancy either with or without careful laboratory observations of the blood was of little or no value, to review the great number of basic factors in the increase of values in the peripheral blood in pregnancy as outlined in preceding paragraphs, and to evaluate current widely accepted practices concerning hematinic therapy. Obstetrical patients treated in private practice were divided into five groups in a non-selected manner. All patients were instructed as

TABLE 1.—*Mean erythrocyte count (in millions per cu. mm. of blood)*

Therapy used	No. of patients	7 months	Term	Change	
None	26	3.859	4.029	+.170	Combined variance of changes
Hydrochloric acid	30	3.869	4.008	+.139	
Ferrous sulfate	27	3.794	4.345	+.551	
Fesmocox*	24	3.733	4.210	+.477	$S^2 = .2358$
Saccharated iron oxide	20	3.640	4.103	+.463	$S = .4856$

*Ferrous sulfate and molybdenum oxide complex.

TABLE 2.—*Mean hemoglobin (in gms. per 100 cc. of blood)*

Therapy used	No. of patients	7 months	Term	Change	
None	26	10.15	11.51	+1.36	Combined variance of changes
Hydrochloric acid	30	10.57	11.64	+1.07	
Ferrous sulfate	27	10.61	13.09	+2.48	
Fesmocox*	24	10.68	12.94	+2.26	$S^2 = 1.611$
Saccharated iron oxide	20	9.97	12.38	+2.41	$S = 1.27$

*Ferrous sulfate and molybdenum oxide complex.

TABLE 3.—*Mean packed cell volume (per cent)*

Therapy used	No. of patients	7 months	Term	Change	
None	26	34.0	37.3	+3.3	Combined variance of changes
Hydrochloric acid	30	34.5	37.1	+2.6	
Ferrous sulfate	27	34.9	40.2	+5.3	
Fesmocox*	24	35.0	40.5	+5.5	$S^2 = 12.113$
Saccharated iron oxide	20	32.5	38.4	+5.9	$S = 3.48$

*Ferrous sulfate and molybdenum oxide complex.

TABLE 4.—*Mean color index*†

Therapy used	No. of patients	7 months	Term	Change	
None	26	.909	.965	+.056	Combined variance of changes
Hydrochloric acid	30	.946	.993	+.047	
Ferrous sulfate	27	.963	1.020	+.057	
Fesmocox‡	24	.971	1.042	+.071	$S^2 = .016632$
Saccharated iron oxide	20	.941	1.025	+.084	$S = .1290$

†Color index = $\frac{\text{Hemoglobin grams per 100 cc.} \times 6.9}{\text{Erythrocytes millions per cu. mm.} \times 20\ (\text{Wintrobe})}$

‡Ferrous sulfate and molybdenum oxide complex.

to diet adequate in calories, vitamins, protein, carbohydrate and fat. In addition they were told to drink one quart of skimmed milk and to take one multiple vitamin capsule daily. Adherence to diet and other prescription was under meticulous and personal control. Each patient, when the gestation period reached seven months, was assigned to either a control or treatment group. Laboratory determination of the hemoglobin concentration, packed cell volume and erythrocyte content of the peripheral blood was carried out.

The first group of patients (Group I) consisted of 26 who received no supplemental hematinic therapy of any sort. Group II was made up of 30 patients who received 0.6 cc. of dilute hydrochloric acid three times daily with meals. Patients in these two groups received no iron therapy as such. Group III consisted of 27 patients who received three times daily, with meals, 1 gm. in divided portions of enteric coated (and, incidentally, iron protective coated) ferrous sulfate U.S.P. In Group IV were 24 patients who received two enteric and iron protective coated tablets containing each 0.195 gm. of ferrous sulfate and 0.003 gm. of molybdenum oxide three times daily with meals. Group V consisted of 20 patients who received saccharated iron oxide intravenously during the last two months of pregnancy. The dosage given was calculated on the basis of the hemoglobin deficiency. One hundred milligrams of elemental iron (or one 5.0 cc. ampoule) was injected intravenously for each 0.6 gram deficit of hemoglobin per 100 cc. of blood, and the dosage did not take into account the increase in blood volume. The various treatments described were begun on all patients at seven months of gestation regardless of the presence or absence of anemia, with the prime objective of determining whether there would be any differences in the various findings in the peripheral blood associated with the routine use of the various agents of therapy. When the patients reached term, as determined by the onset of labor, the various laboratory studies were repeated.

The data obtained in all groups were subjected to analysis. Table 1 contains the figures for the mean erythrocyte count in millions per cu. mm. of blood at the seven-month period and again at term. Table 2 gives similar data as to mean hemoglobin levels. Table 3 similarly contains the mean figures for the packed cell volume, and the mean values of the color index are given in Table 4. The standard deviation was then calculated according to the formula

$$S^2 = \frac{\Sigma d^2 - \frac{(\Sigma d)^2}{N}}{N - 1}$$

wherein

S^2 = (standard deviation)^2
N = number of patients in group
Σd = sum of the differences of each observation from seven months to term
Σd^2 = sum of the same differences squared

RESULTS

There was an increase in all the mean values from the time the patients were observed initially until the time labor commenced. The erythrocyte count (Table 1) increased in all groups including the control group and the group made up of patients who received hydrochloric acid. However, patients in the three groups in which specific iron therapy of one kind or another was given had a much greater increase in erythrocyte count. The mean hemoglobin level increased in all groups also, and similarly there was a much greater rise in patients who received

some form of iron as compared with those who were in either the control group or the group in which hydrochloric acid only was given. The mean packed cell volume likewise rose higher in the patients who received some form of iron therapy as compared with those in control groups or in groups receiving hydrochloric acid only. In none of the five groups, however, was there any significant change in the values of the color index; indeed, the color indices varied little from group to group.

By the method of Scheffé it was determined statistically that the differences in gains in all four variables (erythrocyte count, hemoglobin content, packed cell volume and color index) as between the three groups of patients treated with some form of iron were not sufficiently large (compared to the natural variation in gain from patient to patient) to be significant at the 5 per cent level. There was therefore no basis for concluding that any of the three iron preparations used is better, or worse, than any of the others. Likewise the difference in gains on the same four variables between the two groups not receiving iron were too small to justify conclusion that there was any true difference between the group receiving hydrochloric acid and the group receiving no therapy (control group) with respect to these hematological variables.

On the other hand, as to three of the variables—erythrocyte count, hemoglobin content and cell volume—the gains of patients receiving some one of the three forms of iron therapy were significantly larger, at the 5 per cent level, than the gains of patients in the two groups not receiving iron.

DISCUSSION

The beginning premise that supplemental iron therapy in the last part of pregnancy is of little or no value was found to be not true. Patients who received iron therapy as compared with the two groups of patients receiving no iron—the control group and the group receiving hydrochloric acid—had relatively greater response as regards erythrocyte count, hemoglobin level and packed cell volume. There was no significant difference as to color index between the control groups (hydrochloric acid and control groups) and the groups in which treatment with iron was given. This is to be expected when one considers the factors involved in the color index—namely, hemoglobin and numbers of erythrocytes plus the utilization of a constant factor. When the color

$$\text{index} = \frac{\text{hemoglobin grams per 100 cc.} \times 6.9}{\text{erythrocytes millions per cu. mm.} \times 20},$$

it is obvious that when groups of patients are given treatment which increases both hemoglobin and the number of erythrocytes, there may not be a great change in the color index.

Side effects of the various preparations that were used were of more than passing interest. In only one case was it necessary to stop treatment because of gastrointestinal intolerance to ferrous sulfate, and in no case because of intolerance to ferrous sulfate-molybdenum oxide complex. There were few unfavorable reactions to intravenous use of saccharated iron oxide. One patient had syncope once but it did not recur on subsequent injections. Two patients noted giddiness or lightheadedness on one occasion. There were a number of patients in whom sore antecubital fossae, containing hematomas developed, but none requested discontinuance of therapy. An interesting side effect of the use of hydrochloric acid was that in many cases patients who had heartburn without the medication were relieved of this common disorder of pregnancy after they began taking it. Perhaps heartburn is due to achlorhydria, a condition present in many pregnant women, as was noted by Strauss and Castle. This observation will be subjected to further study.

1300 Bancroft Avenue, San Leandro.

REFERENCES

1. Benstead, N., and Theobald, G. W.: Iron and the physiological anemia of pregnancy, Brit. Med. J., 1:407-410, Feb. 23, 1952.

2. Channing, W.: Notes on anhæmia, N. E. Quart. Med. and Surg., 1:157-188, Oct. 1842.

3. Cox, K. E.: Anemia in pregnancy, Postgrad. Med., 2: 219-222, March 1952.

4. Dieckmann, W. J., and Priddle, H. D.: Anemia of pregnancy treated with molybdenum-iron complex, Am. J. Ob. and Gynec., 57:541-546, March 1949.

5. Dieckmann, W. J., Priddle, H. D., King, J. A., and Forman, J. B.: Prophylactic use of molybdenum-iron complex in pregnant patients, Am. J. Ob. and Gynec., 59:442-444, Feb. 1950.

6. Eastman, N. J.: Williams Obstetrics, Appleton, Century, Crofts, Inc., N. Y., 1950, 1176 pp.

7. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics, The Macmillan Co., N. Y., 1941, 1383 pp.

8. Hamilton, H. G., Higgins, R. S., and Alsop, W. S., Jr.: Iron metabolism in anemias of pregnancy, S. Med. J., 46:117-127, Feb. 1953.

9. Kartchner, F. D., and Holmstrom, E. G.: Treatment of iron deficiency anemia of pregnancy with intravenous iron, Am. J. Ob. and Gynec., 60:1288-1297, Dec. 1950.

10. Nicholson, D. B., and Assali, N. S.: The hematologic response of the pregnant woman to intravenous saccharated iron oxide, Surg., Gynec. and Ob., 94:513-518, May 1952.

11. Scheffé, H.: A method for judging all contrasts in the analysis of variance, Biometrika, 40:87-104, June 1953.

12. Strauss, M. B., and Castle, W. B.: Studies of anemia in pregnancy. I. Gastric secretion in pregnancy and puerperium, Am. J. Med. Sci., 184:655-662, Nov. 1932.

13. Strauss, M. B., and Castle, W. B.: Studies of anemia in pregnancy. II. The relationship of dietary deficiency and gastric secretion to blood formation during pregnancy, Am. J. Med. Sci., 184:663-673, Nov. 1932.

14. Talso, P. J., and Dieckmann, W. J.: Anemias of pregnancy, Am. J. Ob. and Gynec., 55:518-523, March 1948.

15. Wolff, J. R., and Limarzi, L. R.: The clinical management of the anemias of pregnancy, Am. Pract., 3:475-480, April 1949.

16. Wintrobe, M. M.: Clinical Hematology, Lea and Febiger, Philadelphia, 1942, 792 pp.

Needle Biopsy in Diagnosis of Prostatic Cancer

JOSEPH J. KAUFMAN, M.D., MILTON ROSENTHAL, M.D., and WILLARD E. GOODWIN, M.D., Los Angeles

• *Four methods available for the diagnosis of carcinoma of the prostate—digital rectal evaluation, prostatic smear, needle biopsy and open perineal or transurethral biopsy—were studied and correlated.*

One hundred ten patients with clinical indications of cancer of the prostate were subjected to needle biopsy and open perineal or transurethral biopsy. Seventy of the same patients had prostatic smear examination.

Using the open perineal biopsy or the positive transurethral biopsy as the standard, the accuracy of prostatic palpation, prostatic smear and needle biopsy were obtained.

A high degree of correlation (74 per cent) was demonstrated between digital rectal evaluation and positive surgical biopsies in both early and late cases. There were 17 false positive clinical diagnoses.

The prostatic smear showed an overall correlation of 45 per cent when compared with the results of positive surgical biopsy.

The overall accuracy of needle biopsy was 73 per cent. However, in the last 39 cases, including eight in which the carcinomas were of groups A and B (curable), the needle accuracy was 100 per cent.

When there is clinical indication of malignant disease of the prostate, needle biopsy of the lesion is warranted and should be done before definitive or palliative treatment is undertaken.

CANCER OF THE PROSTATE causes more than 10,000 deaths in the United States every year.[2] On the basis of these figures it can be estimated that in California alone more than 700 men die of the disease yearly. It accounts for 90 per cent of all male genital cancers and for 63 per cent of all male genitourinary cancers. Only carcinoma of the stomach and bowel cause more cancer deaths among the male population.[2]

Despite the progress that has been made in the use of endocrine substance in control of advanced cancer of the prostate, the only method of curing this disease is complete prostatectomy at a time when the tumor is still localized in the prostate.

It is generally agreed that only 5 to 10 per cent of prostatic cancers are diagnosed early enough to permit operation with a reasonable chance of cure.[3, 6] This figure has not changed appreciably in the last 30 years, which indicates that progress in the early diagnosis of the disease has lagged. Yet in 90 per cent of cases of overt cancer of the prostate the tumor can be felt on digital rectal examination. Since it is a disease that produces no symptoms in its early stages, patients do not seek medical attention. Therefore, routine and frequent digital rectal examinations are of signal importance. These must be done critically; and because of its prevalence the possibility of prostatic cancer should always be considered in men over 40 years of age. Unusual induration, nodularity, or fixation of the prostate cannot be ignored. On the contrary, if progress in the diagnosis of this disease is to be made, these findings must be considered indicative of cancer until proved otherwise.

Whether the lesion felt is small or large and whether the prostate is mobile or fixed, a confirmed diagnosis is necessary before instituting appropriate definitive or palliative treatment. What methods are available for confirming the diagnosis of clinically suspected cancer of the prostate? Acid phosphatase determination, bone x-ray examination and marrow aspiration are often valuable in establishing the diagnosis of advanced incurable prostatic cancer. But when results of these examinations are negative they have not excluded carcinoma of the prostate. The administration of estrogens as a "therapeutic test" is not reliable and may often so confuse the picture that a proper diagnosis is not made.[11]

Histological confirmation of the disease can be made in several ways. Of these ways, only open perineal biopsy has been considered reliable in the past. Transurethral biopsy is valuable only if positive, since cancer still confined to the posterior portion of the gland may easily escape the resectoscope.

Prostatic smear using the Papanicolaou technique, although enthusiastically received, has been disappointing to most investigators as a method of detect-

Presented before the Section on Urology at the 82nd Annual Session of the California Medical Association, Los Angeles, May 24-28, 1953.

From the Department of Surgery, Division of Urology, School of Medicine, The University of California at Los Angeles, and The Division of Surgery, The Wadsworth Hospital, Veterans Administration Center, Los Angeles.

Dr. Rosenthal was responsible for interpreting the prostatic smears in this study. The routine pathologic studies were done by the department of pathology, Veterans Administration Center.

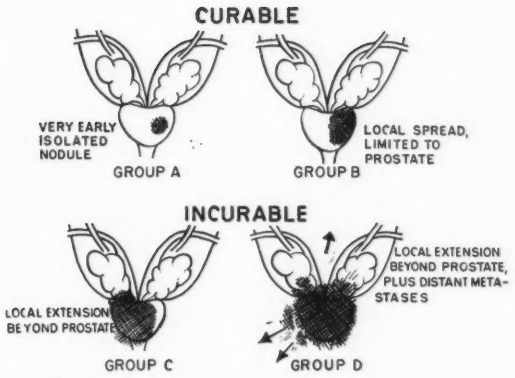


Chart 1.—Classification of cancer of the prostate.

ing or confirming the diagnosis of early prostatic carcinoma.[1]

Needle or punch biopsy of the prostate through the perineum has never been widely adopted. Despite a few encouraging reports[8, 10] many urologists have had brief and disappointing results with its use.

The present study was undertaken to evaluate and compare the results of digital rectal examination, prostatic smear, and needle biopsy in 110 cases of clinically suspected carcinoma of the prostate in both early and advanced stages of the disease. Either open perineal or transurethral biopsy was used as a standard in evaluating the results.

The study showed that with digital rectal examination as a method of detecting cancer of the prostate and with the biopsy needle as the confirmatory agent, a high degree of accuracy can be achieved in establishing the diagnosis of both early and advanced cases.

METHODS

On the basis of clinical, laboratory, and operative findings the cases were categorized as shown in Chart 1. Groups A and B represent disease still confined to the prostate and hence potentially curable by appropriate operation. Pictorial records were made of the digital rectal observations in all cases. For purposes of uniformity in interpretation, rectal examination of each patient was always done by one of the authors. Induration, nodularity, obliteration of sulci and fixation were the palpatory criteria used. Acid phosphatase determinations and roentgenological bone surveys were done in all cases and were helpful in classifying cases in Groups C and D. Biopsy was done whenever there was any question as to the nature of the palpatory findings even though in some instances the diagnosis of cancer was considered unlikely.

Examination of smears of prostatic fluid was done in 70 of the 110 cases, and the Papanicolaou technique of preparation was used (Figure 1). Indwelling catheters, inability to obtain material by massage, and occasional tenderness of the prostate were interfering factors in the 40 cases in which smear examination was not done.

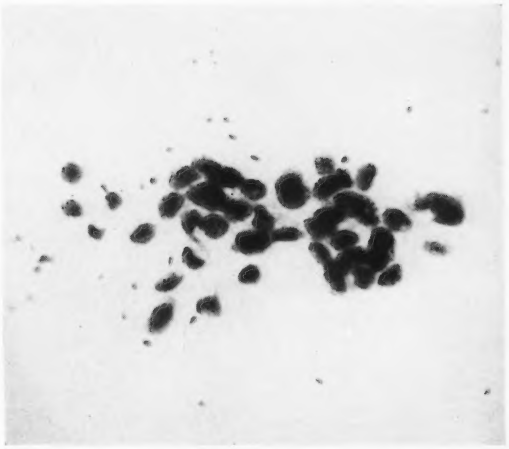


Figure 1.—Group of prostatic carcinoma cells showing nucleo-cytoplasmic disproportion and variations of nuclear size, shape and staining density (×650).

A VIM-Silverman biopsy needle was used almost exclusively in this series. The technique that gave the best results is one in which the needle is introduced just anterior to the anus. The needle is advanced anterior to the rectum and is always palpable by the finger in the rectum, which directs the tip to the suspected area in the prostate (Figures 2 and 3). Multiple cylinders of tissue were taken in the last 40 cases.

Open perineal biopsy was done in 80 of the 110 cases. Generous wedges of tissue were taken from the suspected area as well as from other less suspicious areas (Figure 4). Paraffin sections were made from the biopsy specimens in all cases. A distinct advantage of the open perineal biopsy is that it gives important information concerning fixation of the prostate, knowledge of which will affect any decision regarding the feasibility of radical prostatectomy.

Transurethral resection was done only when clinical observations indicated the need for relief of obstruction and not as a primary biopsy procedure.

Detailed descriptions of the technique of prostatic smear, needle biopsy, open perineal biopsy and transurethral biopsy are given elsewhere.[7]

RESULTS

In the present study the results of clinical impression, of prostatic smear examination and of needle biopsy were compared with the results of surgical

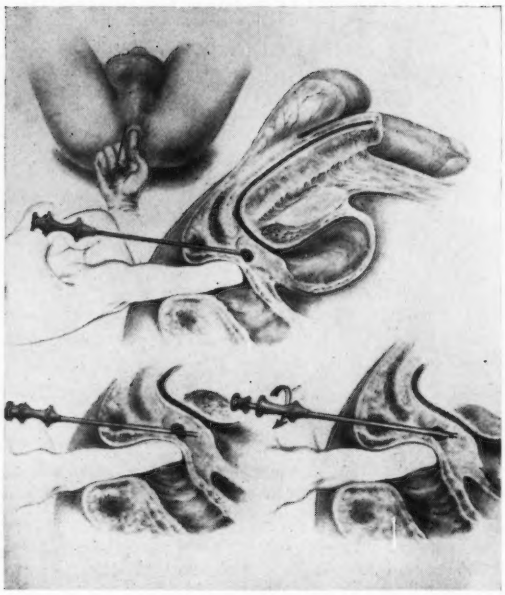


Figure 2.—Artist's drawing of needle biopsy technique. *Center,* needle advanced up to, but not into, nodule. *Lower left,* obturator removed and biopsy blades advanced into nodule. *Lower right,* outer sheath advanced and rotated, severing cylinder of tissue at its base.

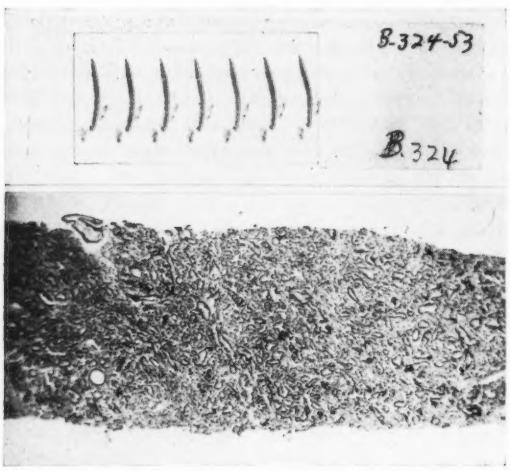


Figure 3.—*Upper,* microscopic slide showing multiple sections of Silverman needle biopsies of the prostate (slightly larger than actual size). *Lower,* low power photomicrograph of Silverman needle biopsy showing carcinoma (×100).

(open perineal or transurethral) biopsy. Open perineal biopsy, positive and negative, and positive transurethral biopsy were the standards. (Open perineal biopsy is not infallible but is generally agreed to be the most reliable method of confirming the diagnosis.) The result are shown in Table 1.

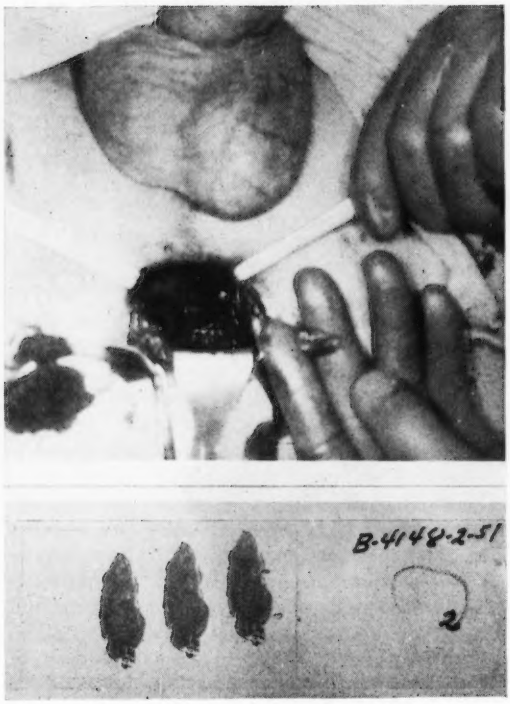


Figure 4.—*Upper,* view of wedge biopsy just taken at open perineal exposure of the prostate. *Lower,* microscopic slide showing size of open prostatic biopsy.

1. *Clinicopathological Correlation*

In Groups C and D the clinicopathological correlations were 95 and 100 per cent respectively. In Groups A and B the correlations were 47 and 53 per cent respectively, with an average of 50 per cent.

In only one instance in this series was carcinoma proved by needle biopsy in a case considered negative clinically. This was a case in Group B.

Carcinoma was erroneously suspected in 17 cases as proved by open biopsy. All the errors occurred in Groups A and B, which indicated "overdiagnosis" in cases in which there was suggestion of early carcinoma.

2. *Correlation of Smear Examination and Biopsy*

In advanced carcinoma (Groups C and D) the correlation of results of examination of smears and examination of tissue was 66 per cent, a figure somewhat lower than that achieved by other investigators.[1] In early cancers (Groups A and B) the correlation was 21 per cent. The greater correlation obtained in the advanced carcinomas is consistent with the presence of cancer in the major prostatic ducts or urethra; whereas when the tumor is small and still confined to the periphery, exfoliated cancer cells are less likely to be found.

3. *Correlation of Needle Biopsy and Surgical Biopsy*

The accuracy of needle biopsy was 82 per cent in advanced carcinoma and 65 per cent in Groups A and B. The results of needle biopsy in the last 39 cases show the benefit of experience and of multiple needle biopsies (Chart 2). In those cases the accuracy of needle biopsy was 100 per cent when compared with the results of open and transurethral biopsy. This is particularly rewarding when it is considered that the diagnosis of carcinoma was made from the needle biopsy in eight cases of Groups A and B. By contrast, the value of experience in the technique of using the biopsy needle is pointed up by the results of needle biopsy in the first 22 cases of this series, in which the correlation of needle biopsy and surgical biopsy was less than 50 per cent.

DISCUSSION

This study emphasizes the importance of digital rectal examination in detecting cancer of the prostate, not only in advanced cases but also at a time when surgical cure is possible. This is in contradistinction to the view held by some urologists that, once carcinoma is palpated on rectal examination, it is too late for primary surgical treatment.[4] In this series cancer was found on only one occasion when, on the basis of digital rectal examination, it was considered unlikely. All the remaining error was made in "overdiagnosing" carcinoma clinically, and the correlation figures given in Table 1 indicate this error in overdiagnosis. This is considered a salutary trend since, without suspicion, early cases would be rarely diagnosed and there would be few cures.

TABLE 1.—*Results of various methods of diagnosis of prostatic carcinoma*

	Group A 28 cases	Group B 25 cases	Group C 38 cases	Group D 19 cases
Positive open biopsy	7	11	19	6
Positive transurethral biopsy	0	1	16	13
Total	7	12	35	19
Positive clinical impression*	15	19	37	19
Accuracy	47%	53%	95%	100%
Positive prostatic smear†	2‡	1	8	9
Accuracy	17%	25%	42%	90%
Positive needle biopsy	5	7	26	17
Accuracy	71%	58%	74%	90%

*Errors made in overdiagnosis: Clinical Impression / Surgical Biopsy

†Figures represent accuracy of smear only in those cases in which both smear and biopsy were done.

‡One false positive smear.

Overall Accuracy		Accuracy in Groups A and B (Curable)	
Clinical	74%	Clinical	50%
Smear	45%	Smear	21%
Needle	73%	Needle	65%

	A POS	A NEG	B POS	B NEG	C POS	C NEG	D POS	D NEG
SURGICAL BIOPSY	3	5	5	7	12	1	6	0
CLINICAL IMPRES.	4	4	5	7	12	1	6	0
NEEDLE BIOPSY	3	5	5	7	12	1	6	0

CLINICAL ACCURACY - (39 Cases) - 92%
NEEDLE ACCURACY - (39 Cases) - 100%

Chart 2.—Relative accuracy by various means of diagnosis.

The results of prostatic smear examination in this series were generally in agreement with those obtained by other investigators.[1] The results were poor in confirming early cancers (Groups A and B). In advanced carcinoma the correlations were correspondingly better. The present series was too small, however, to warrant an accurate appraisal of this method. The fact that prostatic smear requires pathologists experienced in its special techniques and interpretation lessens its value. While the smear appears to be "second best" when compared to needle biopsy as a nonoperative means of confirming the diagnosis of suspected prostatic cancer, the true value of the method may still be in the detection of carcinoma in clinically unsuspected cases.[9]

The results of needle biopsy paralleled those of clinical evaluation on the basis of digital rectal examination. However, in the last 39 cases, after proficiency with the method was achieved, the results of needle biopsy surpassed those of clinical impression. The two methods are complementary, since without clinical palpatory suspicion there is no basis for needle biopsy. Furthermore clinical findings (in the absence of positive results of bone survey, acid phosphatase determination or examination of marrow aspirate) provide only an impression, while a positive result of needle biopsy gives a definitive diagnosis.

Needle biopsy will obviously not compete with open perineal biopsy as a means of ruling out carcinoma, but this does not detract from its value. It is a procedure which can be done in the office under local anesthesia. Many patients may object to a diagnostic operation such as open perineal biopsy which involves hospitalization and anesthesia. When the needle biopsy is positive in cases of Groups A and B, the physician can proceed directly with radical prostatectomy either by perineal or retropubic approach. If a positive result is obtained by needle biopsy in Groups C and D, and transurethral resection is not indicated for relief of obstruction, estrogen therapy with or without castration can be undertaken with the assurance of confirmed tissue diagnosis. Intraprostatic injection of radioactive colloidal gold and chromic phosphate is now under trial as palliative treatment for advanced cancer of the

prostate. In advanced cases, positive tissue diagnosis achieved without recourse to surgical exposure of the prostate is of great value before treatment with isotopes is instituted. In addition, needle biopsy can be used when follow-up histological examinations are desired to evaluate the effects of various palliative treatments in Groups C and D.

If the result of needle biopsy is negative, the procedure can be repeated at intervals of two or three weeks. If the results are consistently negative and the clinical impression is one of carcinoma, open perineal exposure and excision of generous biopsy specimens are in order.

The possible dangers of needle biopsy deserve mention. No complications have occurred in the 110 cases in this series in which the Silverman needle was used. In one patient in whom a large punch biopsy instrument was used, a huge pelvic hematoma requiring surgical drainage developed. The dangers of perforation of the rectum, bladder or urethra with the resultant possibility of fistula have occurred to many urologists. In this series the rectum was accidentally entered four times and the bladder was penetrated on more than ten occasions without untoward sequelae, despite the fact that no special measures were taken following their occurrence.

The possibility of implanting cancer in the path of the needle seems remote in view of the fact that no such cases have been reported.*

The difficulties of making a tissue diagnosis from a needle biopsy have been stressed by others. However, if several adequate cylinders are taken, sufficient tissue will be available for a pathological interpretation. No special training or experience is necessary in interpreting the slides as is the case with the Papanicolaou smears. There may be cases where the pathological diagnosis is doubtful, but with repeated multiple biopsies many such problems will be resolved.

In conclusion, improved diagnosis of cancer of the prostate is not difficult to achieve. In early (operable) cases presumptive diagnosis can often be made on the basis of digital rectal findings. "Overdiagnosis" of cancer is excusable. With needle biopsies, microscopic confirmation can be achieved in a large percentage of patients suspected clinically of having cancer of the prostate. Open perineal biopsy should be made after repeated negative needle biopsies in clinically suspected cases. Positive microscopic diagnosis of prostatic cancer in Group A or B is definite indication for total excision of the prostate and seminal vesicles in patients who have a statistical life expectancy of ten years. In late (inoperable) cases presumptive diagnosis can be made on the basis of digital rectal examination. Metastasis to bone and elevated acid phosphatase provide reliable confirmation of the diagnosis, but in the absence of these phenomena—and often they are absent—the needle biopsy may provide histological justification for castration and other forms of palliation.

8820 Wilshire Boulevard, Beverly Hills (Kaufman).

*A recent article by Clark, B. G., Leadbetter, W. F., and Campbell, S. J. (J. Urol., 70:937-939, 1953) reports the first recorded case of implantation of prostatic carcinoma in the site of perineal needle biopsy.

REFERENCES

1. Boyer, W. F.: The cytological diagnosis of prostatic carcinoma, Proc. Second Natl. Cancer Conf., Cincinnati, March 1952.

2. Federal Security Agency: Cancer Mortality in the United States, Office of Vital Statistics, July 19, 1950.

3. Colston, J. A. C.: Carcinoma of the Prostate; a study of the percentage of cases suitable for the radical operation, J.A.M.A., 122:781-784, July 17, 1943.

4. Correspondence: Surgery in cancer of the prostate, J.A.M.A., 119:669, June 20, 1942.

5. Goodwin, W. E.: Radical prostatectomy after previous prostatic surgery. Technical problems encountered in treatment of occult prostatic carcinoma, J.A.M.A., 148:799-803, March 8, 1952.

6. Jewett, H. J.: Radical perineal prostatectomy for cancer of the prostate: An analysis of 190 cases, J. Urol., 61: 277-280, Feb. 1949.

7. Kaufman, J. J., Rosenthal, M., and Goodwin, W. E.: Methods of diagnosis of carcinoma of the prostate, J. Urol., 72:450-465, Sept. 1954.

8. Pierson, E. L., and Nickerson, D. A.: Biopsy of the prostate with the Silverman needle, N.E.J.M., 228:675-678, May 27, 1943.

9. Peters, H.: Prostatic smear and its clinical usefulness, J. Urol., 66:770-777, Dec. 1951.

10. Semple, J. E.: Carcinoma of the prostate; a comparison of methods of diagnosis, Brit. Med. J., 1:1236-1238, June 2, 1951.

11. Smith, G. G.: The treatment of carcinoma of the prostate, J. Urol., 64:671-680, Nov. 1950.

Discussion by **BRADFORD W. YOUNG, M.D., San Francisco**

This excellent study serves to reemphasize an efficient method of applying the well established surgical principle of simple biopsy in carcinoma of the prostate. There has been a tendency to neglect this procedure in this disease. Needle biopsy of the prostate for suspected early carcinoma fills the gap neatly between the potentially overenthusiastic clinical suspicion and the open perineal biopsy with its drawbacks of hospitalization, anesthesia, expense and the often equivocal results of frozen section diagnosis.

The place of needle biopsy in the diagnosis and management of carcinoma of the prostate appears to lie in two separate stages of the tumor: (a) The incidental small nodule discovered on routine rectal examination, and (b) the extensive, fixed carcinoma without severe obstruction, which is to be managed with hormonal control. Of these the former is the more important, certainly, for in these tumors we stand the only chance of cure. In the second type of tumor a positive biopsy (though statistically in this study of no greater accuracy than clinical impres-

sion—i.e., the authors' Groups C and D) can be of paramount importance when orchiectomy or adrenalectomy is planned.

The quixotic prostatic carcinoma is a disease in which the tendency of the physician is to make his therapeutic moves in response to the progress of the cancer—treating obstruction with resection, extension with estrogens, metastasis with orchiectomy, and "autonomous" growth with last ditch cortisone or adrenalectomy. The timing and combinations of these measures vary widely, but the general principle is one of response to the tumor. Unfortunately, in all but the earliest cases this has to be the case, but it is not ideal management.

In carcinoma of the prostate we have at this time probably the most effective agents for combating an established cancer: The estrogens and methods of withdrawing the androgenic support of tumor growth. Still the ultimate biochemical weapon with an effectiveness of the order of that exhibited by insulin in diabetes or Terramycin against a sensitive strain of Escherichia coli, is not yet available. This leaves us in a philosophical limbo in which early radical operation still offers the best opportunity of cure, and our estrogenic weapons must be reserved to support the attack. This course rests upon positive biopsy more securely than any other single diagnostic measure. The perineal needle-biopsy method for obtaining tissue for study simplifies the procedure greatly and should submit many more suspicious prostatic nodules to close scrutiny under the microscope. This will accordingly present more early cases for radical prostatectomy.

The objections to needle biopsy of the prostate are well outlined by the authors, and I agree that they are of minor importance when weighed against the advantages of early diagnosis—with this great accuracy. However, I can visualize a respectable hematoma from a lacerated hemorrhoidal vein in occasional cases. Also it has been estimated that some prostatic carcinomata (probably less than one third) arise in the anterior portion of the gland. These are unfortunately inaccessible to either the examiner's rectal finger or the perineal needle, and represent a remaining hiatus in early diagnosis of this disease.

Veterans' Care

Following are excerpts from Franklin D. Roosevelt's veto message to Congress on Appropriation Bill relating to World War veterans, March 27, 1934:

"I COME NOW to the provisions in this Act relating to World War veterans. First let me speak of principles. Last October I said this to the American Legion Convention:

" 'The first principle, following inevitably from the obligation of citizens to bear arms, is that the Government has a responsibility for and toward those who suffered injury or contracted disease while serving in its defense.

" 'The second principle is that no person, because he wore a uniform, must thereafter be placed in a special class of beneficiaries over and above all other citizens. The fact of wearing a uniform does not mean that he can demand and receive from his Government a benefit which no other citizen receives. It does not mean that because a person served in the defense of his country, performed a basic obligation of citizenship, he should receive a pension from his Government because of a disability incurred after his service had terminated, and not connected with that service.

" 'It does mean, however, that those who were injured in or as a result of their serving are entitled to receive adequate and generous compensation for their disabilities. It does mean that generous care shall be extended to the dependents of those who died in or as a result of service to their country.

" 'I am very confident that the American people, including the overwhelming majority of veterans themselves, approve these principles and in the last analysis will support them.' "

Childhood Ecology

Factors Influencing Maturation

H. E. THELANDER, M.D., San Francisco

• An attempt has been made to pick out of the whole study of childhood ecology three of the fairly well known areas involved in maturation, namely physical growth, intellectual development, and emotional reactions and to indicate not only the uniformity of patterns in each of these throughout life but the effect of certain adverse factors in deterring normal maturation. The areas are interdependent and failure of the child to master any level of his development adequately influences adversely the total development of his personality.

WEBSTER defines ecology as the biology dealing with the mutual relations between organisms and their environment. Poets and philosophers have said it more succinctly in phrases like "The boy is father of the man," "As the twig is bent the tree will grow," and "The proper study of mankind is man." The less astute in everyday parlance, however, are still consoling themselves with "He will outgrow it."

It would indeed be presumptuous in a communication no longer than the present one, to attempt anything except to point the direction that physicians and personnel from other disciplines dealing with children might take in order to better understand and enjoy the work and possibly help elucidate the subject of human maturation. The key to the riddle undoubtedly lies in the totality of growth and development, the intrinsic and extrinsic factors that influence the various facets.

The expanding world of childhood may be outlined as follows:

Infancy:
Dependency—Gratification of elementary needs as hunger, discomfort, etc.

1 to 3 years:
First Autonomy—Ambulation; self-feeding; speech; elimination.

3 to 7 years:
First Basic Facts—Sex identification; birth, death; living, non-living; fact, fancy; truth, falsehood; imaginary playmates.

This is followed by the school age period when the tools of learning are acquired; and this takes the child into adolescence or the second autonomy.

The particular human characteristics involved in the process of growing up and maturing are:

1. Physical growth with intrinsic and extrinsic factors influencing it, such as heredity and genetics on one hand and nutrition and disease on the other.

2. Intelligence, influenced partly by inherent ability, partly by opportunity, training and motivation.

3. Feeling or emotions with intrinsic factors of temperament and sensitivity acted upon by the reception encountered by other members of the species.

Through the work of such physicians as Gesell and Washburn as well as many others, pediatricians have come to understand better the physical growth of children. Educators and psychiatrists have elucidated the learning process and the psyche. Seldom, however, do the three disciplines sit down together and really talk it over.

It is interesting to discover, in support of the earlier quotations in this paper, that the learning process does not change particularly its pattern throughout life even though the tools that are employed vary. An infant six months of age approaches a new object by picking it up, passing it from hand to hand, shaking it, and putting it in his mouth. These are the tests of safety and desirability to which he subjects the object before accepting what is new. A scientist takes a new chemical, weighs and measures it, puts it through various experiments in the test tube in a manner very similar to that of the infant making his explorations.

A one-year-old gets his foot caught between the bars of his crib, cries and struggles until it is released. Then what does he do? He puts it right back to see if he can repeat the performance. This is the pattern Fleming followed when he discovered that a mold on culture media had destroyed some of the bacteria, then tried to reproduce the phenomenon by cultures deliberately contaminated.

A child three years of age, when he has put the problem of gaining his first autonomy behind him, discovers, among other things, sex. To him there are boys and girls, men and women. It intrigues him and he may be quite preoccupied with his new interest. His conversation, described by elders as "cute sayings," may run like this: "You are made like mama," or "Boys stand up to wee-wee and girls sit down." Finally when he has solved the mystery he announces repeatedly and at the most unexpected times, "When I grow up I am going to be like daddy." Gradually the interest subsides because it is an accepted fact.

From the Department of Pediatrics, Children's Hospital, San Francisco.

Presented before the Section on Pediatrics at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

Note the similarity in our own field. The discovery of a drug like sulfonilamide and its final place in our armamentarium can be charted by counting the articles concerning it in the Index Medicus over a period of a few years. In other words, throughout life a new idea attracts us, it emerges, gets worked over until it is understood and assimilated, then it is relegated to its proper place in our fund of knowledge.

It is logical, therefore, to raise the question: Does the management of curiosity in early childhood determine to some extent the continuation of interest, enthusiasm and exploration in later life? The adult who ceases early to learn or even to have any desire to learn can be contrasted with the person who may be described as having insatiable curiosity. Does environment partly determine this difference?

In the field of the emotions, again, patterns of reaction are laid down early and probably change little throughout life. In the normal home situation the infant quickly responds to the mother's attention. When he is hungry she feeds him, when he is uncomfortable she comforts him, when she faces him she smiles and plays with him and he learns to goo and coo in return. Pediatricians are familiar with a contrast to this behavior—that of the child who has been reared in an institution without maternal care or any mother substitute in the environment. When such a child is adopted, we have all wondered on a first examination from his behavior whether he is hard of hearing, whether he has poor vision, or whether he is mentally retarded, only to observe pronounced change even after two weeks with a mother. If neglect is prolonged and extreme, he may never learn to react in a wholesome manner to other persons in his environment; may seem to lack the ability to discover any satisfactory interpersonal relationships. This is the common history and pattern in delinquency and crime.

In contrast, gratification in accomplishment is recognizable early. An infant learning to walk shows both pride and pleasure on taking the first step. The motivation for continued experimentation in the field of walking is augmented by the reception the child gets from his parents. This pattern again continues throughout life. We need only cite the pride of the young doctor on receipt of his first check. How often have we heard, "I am going to frame it." And if his wife shares in the pride and pleasure, is he not motivated to greater accomplishment?

The first six or seven years of life, as again was noted by nonmedical people even before confirmed by scientists, are the important ones for establishing patterns of reaction to people and situations and possibly also for dealing with curiosity, interest and enthusiasm. By this age, six or seven, the child has established his reaction to certain basic things in life, as noted in the developmental scale—namely, the acceptance of himself as a person, male and female roles, reaction to authority, birth and death, truth and falsehood, establishment of interpersonal relations. He then enters the school age where he acquires the tools of learning, primarily the "three R's."

The serenity of this period of childhood is interrupted by a growth factor within the organism and suddenly the child is faced with the problem of establishing his second stage of autonomy—namely that of being an adult; and so he enters the turbulent adolescent years.

Thus growth, intelligence and emotion constitute a totality of factors which influence the personality development.

In the expanding world of childhood it is important that each phase be mastered somewhat adequately before the next is entered. If this is not accomplished, progress in the next phase is warped. This is best illustrated by reading ability in school. If the child is unable to master reading in the first grade and is passed on to the next grade, his progress is retarded and he cannot advance until he has in part accomplished his reading. The emotional effect of this, as is well known, can be very great. It is equally true that failure in infancy to develop trust or in the period of one to three years of age to develop a feeling of adequacy may cause later severe emotional disturbances.

Enough evidence has accumulated now to document this concept. Early childhood, as far as personality growth is concerned, is as vulnerable to certain adverse factors as is physical growth in the early period of the fetus to a virus such as that of German measles. The factors or "viruses" that influence development of personality are gradually merging. Among those fairly well established now are abandonment without a mother-substitute in infancy, rejection—overt or subtle—during early childhood, long periods of separation without a mother-substitute, especially in the first three years, as shown by Bowlby[1] in his analysis of separation of children during the war, and in another area such studies as Johnson and Szurek's[2] on the effect upon children of a parent's neuroses, wherein a child in the family is made the scapegoat of a parent's unresolved emotional conflicts and plays the role of a delinquent or criminal. All too frequently physicians, parents and teachers have avoided responsibility by assuming that the child will "outgrow it." It is time that pediatricians, psychiatrists and educators diligently further explore preventive measures against warped personality development.

3641 California Street, San Francisco 18.

REFERENCES

1. Bowlby, J.: Maternal Care and Mental Health, World Health Organization monograph series.

2. Johnson, A., and Szurek, S. A.: Etiology of antisocial behavior in delinquents and psychopaths, J.A.M.A., 154: 814-817, March 6, 1954.

Functional Uterine Bleeding

Etiologic Factors and Therapy

J. G. MOORE, M.D., B. P. SINGH, M.D., and R. S. HOLZMAN, M.D., Los Angeles

• *Endometrial hyperplasia and irregular shedding of the endometrium comprise the largest group of known causes of functional uterine bleeding.*

Most patients with functional uterine bleeding have a normal endometrial pattern.

In a series of patients with functional uterine bleeding, it was noted that 69.7 per cent of endometrial specimens reported as normal showed evidence of hyalinized tissue which included endometrial glands. Tissue of this type was noted in only 3.5 per cent of curetted specimens from patients without functional uterine bleeding.

Diagnostic uterine curettage is the initial step in the management of functional uterine bleeding.

Hysterectomy and radiation castration are seldom necessary in the management of functional uterine bleeding and are indicated only under specific circumstances.

IT IS CONVENIENT to divide cases of excessive uterine bleeding into two general classes, those in which the cause of bleeding is readily ascribed to observable pathologic conditions, and those in which it is assumed to be from "functional" causes. A practical definition of functional uterine bleeding is bleeding that is not associated with neoplastic, inflammatory or trophoblastic change within the pelvis. Obviously, in such circumstances the cause is difficult to diagnose.

HISTORICAL SURVEY

Historically, the development of knowledge of the endometrial patterns associated with functional uterine hemorrhage presents a fascinating story. The recovery from the early misleading nomenclature was a masterful feat in itself, but the persistence of erroneous theories long after the true situation was established is rather dismaying. A brief historical sketch is necessary to an understanding of the confusing and mixed nomenclature associated with various descriptions of this subject.

With the introduction of the curette into gynecology by Recamier in 1850,[19] endometrium was removed for study. Grossly the tissue had a "fungous" and "granulation-like" appearance, and although there was frequently little departure from what we now consider normal endometrium it was assumed that this "fungous" condition was the result of inflammation. In 1875 Olshausen[18] reported a study of *Chronische Hyperplasierende Endometritis* (Endometritis Fungosa) and in 1879 Ruge[20] wrote on *Aetiologie und Anatomie der Endometritis* describing a glandular, interstitial and "mishform" type. These reports, as well as those by others such as Duncan[5] in the English literature, served to perpetuate descriptions that emphasized inflammation—"endometritis fungosa," "endometritis polyposa," and "hemorrhagic endometritis." In 1882 Brenneche[3] suggested that Olshausen's "endometritis fungosa" was not inflammatory change but true hyperplasia. He observed further that the endometrial changes were the result of ovarian abnormalities, and termed the condition "endometritis hyperplastica ovarialis." Despite Brenneche's postulates and the later bacterial confirmation of the noninflammatory nature of the endometrium, and despite the acceptance of these observations by such authorities as Shauta and Cullen, the previous view persisted.

It was not until 1908, when Hitschmann and Adler[8] from Shauta's clinic in Vienna published their classic work on normal cyclic changes in the endometrium, that it became apparent that so many of the previously described conditions were not inflammatory processes. Their article was beautifully illustrated and accompanied by classic descriptions of each phase of the cycle. Not long afterward (1912) Schröder[22] published his fundamental investigations on the relationship of the endometrial cycle to the ovarian cycle. He also described in detail the entity of cystic glandular hyperplasia of the endometrium and correlated it with specific changes in the ovary.[23] Indeed, it was he who suggested[24] the term "metropathia hemorrhagica" for this condition. It was at this point that the present concept of the ovarian-endometrial cycle and the nature of endometrial hyperplasia became firmly established. Since that time the less frequent causes of functional uterine bleeding have been described and explained with varying degrees of successful acceptance.

Numerous references to and descriptions of delayed or irregular shedding of the endometrium[1, 4, 12]

From the Department of Obstetrics and Gynecology, University of California School of Medicine, Los Angeles 24.

Presented before the Section on Obstetrics and Gynecology at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

were made before Meyer[17] described the entity so completely in 1930. In the American literature Traut and Kuder (1935)[27] described irregular shedding and irregular ripening of the endometrium and stated that these disorders were the etiologic factors in one-third of the cases of functional bleeding observed by them. Later McKelvey (1942, 1947)[13, 14] and Holmstrom and McClennan (1947)[9] firmly established the verity of irregular endometrial shedding with the publication of their carefully selected studies. According to Traut, irregular ripening is characterized by intermenstrual bleeding associated with a condition of patchy distribution of both secretory and nonsecretory endometrium. Irregular or delayed shedding of the endometrium is characterized by prolonged (seven or more days) and often excessive cyclic uterine bleeding associated with the persistence or retention of secretory endometrium five or more days following the onset of menstruation. As opposed to endometrial hyperplasia it has no predominance in the menarche or climacteric. Holmstrom and McClennan were able to produce this clinical picture by administering progesterone during the bleeding phase of the menstrual cycle. McClennan (1952),[16] reporting the largest series to date, emphasized the effectiveness of curettage in therapy.

As to the causes of uterine bleeding considered "functional" in nature, only bleeding associated with endometrial hyperplasia and delayed endometrial shedding has been satisfactorily explained. Holmstrom and McClennan expressed mild skepticism concerning irregular ripening as a substantial cause of metrorrhagia. The following is a list of the endometrial conditions which have been observed in careful histologic studies of curetted endometrium associated with functional uterine bleeding:

1. Endometrial hyperplasia
2. Delayed endometrial shedding
3. Irregular endometrial ripening
4. Normal endometrium (a) secretory endometrium, (b) proliferative endometrium, (c) menstruating endometrium.

The reported proportions of the various types of endometrium have varied from study to study. Endometrial hyperplasia has been reported in from 23 to 68 per cent of cases, with most observers reporting a 30 to 40 per cent incidence.[26] The reported incidence of nonhyperplastic endometrium has varied from 30 to 70 per cent, with delayed shedding making up 7 to 15 per cent of this group. Recently Sutherland[25] in two masterful surveys of "functional" uterine bleeding compared the type of endometrium in 1,000 patients without "organic" pelvic lesions with the type in 1,000 patients with gross anatomic defects (Table 1). The proportions of the endometrial types in the two groups were remarkably similar. Unfortunately, in the largest group of patients, those with normal endometrium, the mechanism or cause of bleeding has been poorly explained. Certainly it is agreed that abnormal bleeding may arise from any type of endometrium, secretory included.[11] This situation has led to undue emphasis of such explanations of bleeding as nutritional deficiencies (vitamin B complex),[2] low thyroid function,[7] increased capillary fragility (vitamin P),[6] and increased plasma protamine titrations.[20] These explanations, in the authors' experience, apply to only a small percentage of this large group of functional bleeders.

TABLE 1.—*Condition of endometrium of 1,000 patients without organic lesions, as compared with condition in 1,000 patients who had gross anatomic defects (after Sutherland[25])*

Endometrium	Patients without Organic Lesions	Patients with Anatomic Defects
Normal	547	648
Hyperplasia	265	195
Irregular Shedding and Ripening	39	18
Others (non-functional)	149	139
Total	1000	1000

ANALYSIS OF MATERIAL

In a retrospective study, the records of patients with functional uterine bleeding observed in the gynecologic clinic in a 3-year period 1950-1953 were reviewed. The clinical courses were carefully considered to establish the condition of abnormal uterine bleeding, and then all cases in which there was a pelvic neoplasm, pregnancy effect, pelvic inflammatory condition, or non-neoplastic pelvic tumor (such as adenomyosis or endometriosis) were excluded from the study. In all, the series included 235 women and, as initially considered, the types of endometrium encountered were:

	Number	Per cent
Endometrial hyperplasia	50	21
Proliferative endometrium	103	44
Secretory endometrium	64	27
Menstrual endometrium	18	8
Total	235	100

It was noted that in 79 per cent of cases there was no anatomical diagnosis to account for the abnormal bleeding. It must be emphasized that, during this period, a concerted effort was not always made to time the curettage in order to obtain the maximum chance of demonstrating the diagnosis histologically. While this timing was always desired it was often impractical and, occasionally, impossible. In spite of the inopportune timing of the curettage, the small percentage of definitive diagnoses led the authors to consider the normal endometria in more detail.

In reviewing the clinical records and histological specimens, it was possible to diagnose delayed endometrial shedding in 23 patients (Figure 1). These were patients in the proliferative endometrium

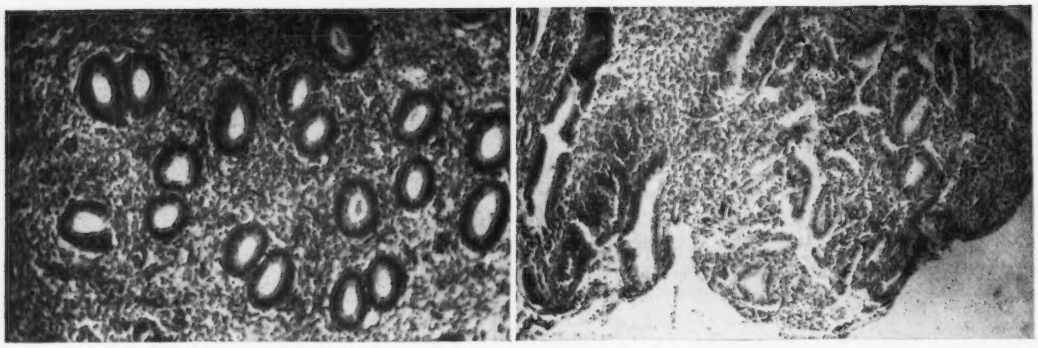


Figure 1.—Irregular endometrial shedding. Note normal proliferative endometrium (seventh day of cycle) on the left and collapsed secretory glands on the right.

TABLE 2.—*Association of endometrial abnormalities in 235 cases of functional uterine bleeding abnormality and normality of endometrium.*

	Normal endometrium	Abnormal endometrium	
Endometrial hyperplasia		50	31%
Irregular shedding		23	
Proliferative endometrium			
Normal	21		
With hyalinized tissue		59	
Secretory endometrium			
Normal	21		
With hyalinized tissue		43	48%
Menstruating endometrium			
Normal	8		
With hyalinized tissue		10	
	50 (21%)	185 (79%)	

Figure 2.—Irregular endometrial shedding. Note the retained secretory endometrium intimately surrounded by hyalinized tissue.

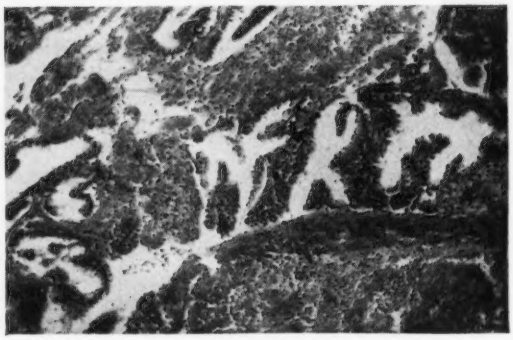


Figure 3.—Hyalinized substance surrounding endometrial glands. The hyalinized material is extensively infiltrated by fibroblasts.

group, who had noted a prolongation and/or increase in cyclic menstrual flow, in whom retention of late secretory endometrium was confirmed on the fifth to seventeenth day after the onset of menstruation. Normally the secretory endometrium should have been shed by at least the third day of menstruation. Often the retained secretory endometrium was degenerating and was surrounded by varying amounts of a hyalinized type of tissue (Figure 2). In this respect it is noteworthy that a large number of specimens in the normal endometrium group also showed this hyalinized tissue. The hyalinized tissue usually contained, or surrounded in intimate association, degenerating endometrial glands and was infiltrated by varying numbers of fibroblasts (Figure 3). Characteristically, no inflammatory reaction was present. Table 2 indicates the number of cases in which this endometrial pattern was associated with the 235 cases of functional uterine bleeding.

It was noted that hyalinized tissue of this kind was found in the curettings from functional bleeders in both proliferative and secretory phases of the menstrual cycle. The addition of these cases to the others with abnormal endometrium makes it possible to associate the abnormal bleeding with an anatomically demonstrable factor in 79 per cent of the patients. It was frequently possible to identify the glands contained within the hyalinized substance as either proliferative or secretory. When such retained secretory endometrium was found in association with proliferative endometrium (Figure 4), it suggested delayed or irregular shedding of the endometrium. However, it must be emphasized that such conclusions are warranted only when the clinical restrictions ascribed to irregular shedding of the endo-

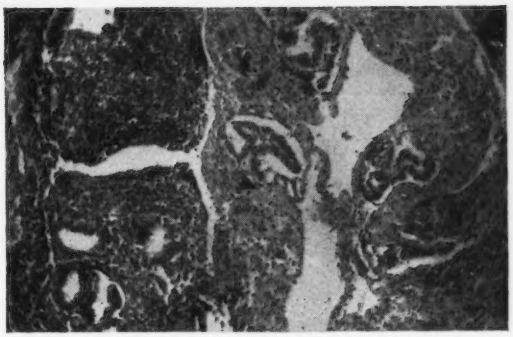


Figure 4.—Secretory glands included within hyalinized substance. Note proliferative endometrium on the right.

metrium have been satisfied. The authors prefer to call it retained, hyalinized endometrial tissue.

How often is this hyalinized tissue observed in the absence of abnormal uterine bleeding? To answer this question, the tissues curetted during the same period from patients who were menstruating normally were reviewed. In large part the patients had had curettement routinely at the time of a vaginal plastic procedure. The following findings were noted:

	No. cases	Per cent
Normal secretory endometrium	12	93
Normal proliferative endometrium	12	
Proliferative endometrium with hyalinized tissue	1	3.5
Endometrial hyperplasia	1	3.5
Total	26	100

Thus, a high incidence of the phenomenon of hyalinized tissue retention was noted in association with abnormal bleeding and a low incidence in normally menstruating women. It is possible that endometrial glands retained through the bleeding phase of menstruation might continue as a stimulant for further bleeding. Blood surrounding these accumulations could organize to form just such a histologic structure as that described. This tissue, once organized and firmly attached, might serve as a focus of continued bleeding. It is equally possible that any bleeding, including that associated with menstruation, might result in clotted blood becoming organized and eventually bring about the phenomenon. When degenerated glands within hyalinized tissue are observed, especially early in the menstrual cycle, there is strong suggestion they were retained from a previous cycle. This picture of hyalinization and retention is noted here only insofar as it supports evidence of previous abnormal bleeding and possibly the abnormal retention of endometrial elements. Of academic importance is the possibility that retained hyalinized fragments, with included endometrium, account for bleeding in a substantial number of patients with functional uterine bleeding. With this a possibility, there is further justification for uterine curettage as a logical therapeutic measure in such cases.

DISCUSSION

Quite naturally the management of abnormal uterine bleeding will vary with the age and parity of the patient, especially if the bleeding is designated as functional. A practical scheme of management is to consider the following measures in order:

1. *Uterine Curettage.* A sound principle in the management of undiagnosed menometrorrhagia is to be as radical as necessary to make sure malignant disease is not present and, after a benign cause has been established, to be as conservative as possible in the treatment. As an initial measure, thorough curettage is usually best for the following reasons: It eliminates or establishes malignancy as a cause; it establishes the diagnosis on a sound basis; it is the most effective method of stopping the bleeding initially; and it is associated with cure in approximately 50 per cent of cases of functional bleeding.

It is prudent, of course, to follow McClennan's advice (1951)[15] and carry out curettage at the best time for establishing the diagnosis histologically. It cannot be too strongly emphasized that curettage, not hysterectomy, is the initial definitive measure in the diagnosis and treatment of abnormal uterine bleeding.

2. *Diet and General Measures.* Experimentally and clinically the Biskinds and others have noted the value of dietary measures in functional uterine bleeding. The fact that vitamin B complex is necessary for the proper metabolism of estrogens in experimental animals cannot be directly applied to clinical therapy but it is logical to treat any associated systemic disease or dietary deficiency. However, such conditions have been observed by the authors in relatively few patients.

3. *Cyclic Steroid Hormone Therapy.* Curettage is vastly superior to large repeated doses of estrogens in the initial suppression of alarming uterine bleeding. If the patient does not respond to curettage, cyclic suppression and release of gonadotrophic activity by estrogen administration is then in order. Stilbestrol by mouth for 21 days, then a seven-day period in which the hormone is not given constitutes the cycle. The dose of 0.5 mg. to 3.0 mg. per day may be increased from the first to the third week, and in the authors' experience stilbestrol is as effective and as well tolerated as the more expensive estrone sulfate or estradiol. In order to luteinize the endometrium and perhaps bring about a more physiological type of withdrawal bleeding, 25 mg. of progesterone may be given orally each day during the third week of the cycle of hormonal treatment, or, if convenient, 1 cc. of progesterone (50 mg. in aqueous suspension) may be given intramuscularly on the twenty-first day. In controlling bleeding asso-

ciated with anovulatory cycles, Holmstrom[10] used only a 25 mg. injection of progesterone each month, thereby eliminating the use of estrogens in a condition felt to be caused by an excess of estrogens. By and large, the reasoning behind the use of cyclic steroid therapy is logical; and clinically the treatment is often effective. Perhaps a valuable feature of the therapy described is that it allows the passage of time in a disease which is usually self-limited.

4. *Androgen Therapy* in functional uterine bleeding is rational only in controlling the initial phase of bleeding. The disadvantages (i.e., masculinization) of its continued use are disconcerting and the method does not seem physiologically sound.

5. *Hysterectomy*. This is a radical method of treating functional uterine bleeding. It is indicated only in women less than 45 years of age when an adequate trial of more conservative measures has proved ineffective. For patients under the age of 35 this procedure is seldom necessary and should be considered with grave concern. This hesitancy is justified in the younger age group not only from the standpoint that hysterectomy is seldom necessary but also because the procedure interrupts a substantial portion of the ovarian blood supply. Also, sudden cessation of menses in a young woman may have more profound effects than are usually anticipated.

6. *Radiation Castration*. This is also a radical method of treating uterine bleeding of benign cause and has been increasingly criticized as operative procedures have become safer and more widely used. However, it does have a place. The use of 1500 r of pelvic x-radiation, or 1500 mg. hours of intrauterine radium is usually sufficient for the purpose and is definitely indicated, in functional uterine bleeding, for patients over 45 years of age in whom adequate conservative measures have proved ineffective. It is best that these age figures be regarded as physiologic estimates rather than as chronologic. In this way a logical flexibility may be exercised. Radiation castration is also indicated as a last resort in the case of younger patients whose general condition contraindicates major operation.

The problem of managing functional uterine bleeding is somewhat simplified by the consideration of two observations: (1) Curettage alone cures functional bleeding in approximately 50 per cent of cases; (2) the majority of cases occur during the menarche or the climacteric, periods which in themselves are temporally limited and consequently act as self-limiting effects. This knowledge encourages temporization with the employment of conservative measures. Such measures discourage the use of irreversible radical procedures while the body is making the necessary adjustments to correct the abnormal bleeding.

800 Westwood Boulevard, Los Angeles 24.

REFERENCES

1. Baniecke, H.: Menorrhgien al Folge mangelhafter Abstossung des Endometriums, Zentralbe. f. Gynäk., 52:955-961, 1928.

2. Biskind, M. S., Biskind, G. R., Biskind, L. H.: Nutritional deficiency in the etiology of menorrhagia, metrorrhagia, cystic mastitis, and premenstrual tension, Surg., Gyn. & Obst., 78:49-57, 1944.

3. Brenneche: Zur Aetiologie der "Endometritis fungosa," speciell der "chronischen hyperplasirenden Endometritis Olshausen's," Arch. f. Gyn., 20:455-486, 1882.

4. Friessen, L. F.: Endometritis Folge abnormales Menstruation, Ursache profuser Blutungen, Zentralbl. f. Gynäk., 38:618-622, 1914.

5. Duncan, J. M.: Diseases of Women, J. A. Churchill, London, 1879.

6. Greenblatt, R. B.: Possible role of Vitamin P in therapy, Obst. & Gyn., 2:530-534, 1953.

7. Haines, S. F., and Mussey, R. D.: Certain menstrual disturbances associated with low basal metabolic rate without myxedema, J.A.M.A., 105:557-560, 1935.

8. Hitschmann, F., and Adler, L.: Der Bau der Uterusschleimhaut des geschlechtsreifen Weibes mit besonderer Berücksichrift der Menstruation, Monatschr. f. Geburtsh. u. Gynäk., 27:1-82, 1908.

9. Holmstrom, E. G., and McLennan, C. E.: Menorrhagia associated with irregular shedding of the endometrium, Am. J. Obst. & Gyn., 53:727-748, 1947.

10. Holmstrom, E. G.: Functional uterine bleeding, J.A.M.A., 156:580-582, Oct. 9, 1954.

11. Jones, H. W.: Functional uterine bleeding with special reference to that associated with secretory endometrium, Am. J. Obst. & Gyn., 35:64-76, 1938.

12. Kaufman, K., and Hoek, W.: Vergleiche histologishe gutartiger Befunde an Schabseln aus dem uterus mit klinischen Erschemungen, Ztschr. f. Geburtsh. u. Gynäk., 90:594-608, 1928.

13. McKelvey, J. L.: Irregular shedding of the endometrium, Lancet, 42:434-438, 1942.

14. McKelvey, J. L., and Samuels, L. T.: Irregular shedding of the endometrium, Am. J. Obst. & Gyn., 53:627-636, 1947.

15. McLennan, C. E.: Some phases of the uterine bleeding problem, West. J. Surg., 59:512-516, 1951.

16. McLennan, C. E.: Current concepts of prolonged or irregular endometrial shedding, Am. J. Obst. & Gyn., 64: 988-998, 1952.

17. Meyer, R.: In Henke-Lubarsch Handbuch d. Spez. Path. Anat. u. Histol., vol. 7, part 1, Springer, Berlin, 1930.

18. Olshausen, R.: Uber chronische hyperplasierende Endometritis des Corpus Uteri, Arch. f. Gynäk., 8:97-133, 1875.

19. Recamier: L'Union Medicale de Paris, 4:266-282, June 1850.

20. Ruge, K.: Zur Aetiologie und Anatomie der Endometritis, Ztschr. f. Geburtsh. u. Gynäk., 5:317-323, 1880.

21. Rumbolz, W. F., Moon, C. F., and Novelli, A. B.: The use of protamine sulfate and toluidine blue for abnormal uterine bleeding, Am. J. Obst. & Gyn., 63:1029-1037, 1952.

22. Schröder, R.: Beiträge zur normalen und pathologischen Anatomie des Endometrium, Arch. f. Gynäk., 98:81-135, 1912.

23. Schröder, R.: Anatomische Studien zur normalen und pathologischen Physiologie des Menstruationszyklus, Arch. f. Gynäk., 104:27-102, 1915.

24. Schröder, R.: Die Pathogenese der Meno-und besonders der Metrorrhagien, Arch. f. Gynäk., 110:633-658, 1919.

25. Sutherland, A. M.: Histology of endometrium in organic uterine hemorrhage, Lancet, 2:742-745, 1950.

26. Sutherland, A. M.: The histology of the endometrium in functional uterine hemorrhage, Glasgow Med. J., 30:1-28, 1949.

27. Traut, H. F., and Kuder, A.: Irregular shedding and irregular ripening of the endometrium, Surg., Gyn. & Obst., 61:145-154, 1935.

Detection of Small Lesions of the Large Bowel

Barium Enema versus Double Contrast

J. MAURICE ROBINSON, M.D., San Francisco

• Roentgen study with the so-called opaque barium enema with some modifications is superior to double contrast study as the primary means of demonstrating polyps in the colon as well as other lesions. The method described combines fluoroscopy, high kilovoltage radiography, fluoroscopically aimed "spot films" taken with compression, suction and evacuation studies. In this way unsuspected as well as suspected polyps can be demonstrated, particularly if attention is directed to the region where polyps are most likely to be found—namely, the distal third of the large bowel.

Double contrast study is quite valuable as a supplement to the modified "single contrast" barium enema, but it has not been sufficiently perfected to replace the modified opaque barium enema as a primary procedure.

In many instances a combination of methods will, of course, be required.

FIFTEEN PER CENT of patients over 50 years of age have polyps in the rectum or colon. The available evidence indicates that probably all polyps of the colon are potentially malignant. They should therefore be detected and eradicated. If the clinician who first sees these patients performs a digital examination and sigmoidoscopy, he will find by far the largest proportion of these polyps and even some early cancers. Radiologists should discover many of the polyps that are above the sigmoidoscopic level. In this way, the incidence of cancer of the colon and rectum, which now causes 17 per cent of all cancer deaths, should be measurably reduced; removing a polyp may prevent a cancer. At one time or another the author has tried the various methods of studying the bowel that other investigators have advocated, has used personal modifications and has tested many barium preparations. The conclusion reached is that the so-called opaque barium enema, with some modifications, is as superior to the double contrast study as the primary means of demonstrating polyps in the colon as it is for other lesions.

Gianturco[2, 3, 4] described a technique with which he was able to demonstrate polyps in 2.5 per cent, or 42, of 1,500 patients. Yet 75 per cent of these patients did not have rectal bleeding. His results are amazing — almost what one might expect in an autopsy series. The author's own technique has a little bit of everybody in it—Schatzki, Templeton, Weber, Jones and Kaplan, Irwin, Ichiban Mori and Devine, and others, But mostly Gianturco.

The principal features of his technique are:

1. A clean bowel. (A clean bowel is absolutely essential.)

2. Films taken with the highest feasible kilovoltage (preferably over 100kv).

3. A barium suspension which is dense enough for good fluoroscopy yet can be penetrated by the x-ray beam. (The idea is to get through the barium, not just around it.)

4. Views of the uncoiled sigmoid colon taken with the overhead tube just as soon as the barium has reached the descending colon.

5. Anterior-posterior and posterior-anterior films of the filled bowel.

The author's own technique, somewhat more elaborate, includes the above, plus the following:

6. Many small spot films of the distal colon with compression (90 to 100kv). This is a very important feature.

7. Fluoroscopy that is perhaps more diligent than Gianturco's.

8. Postevacuation films.

Gianturco's patients are of the type generally seen in any large private clinic. The author's are all office patients, many of them in the older age group, and more of them have symptoms, although 25 per cent of the polyps demonstrated are in patients without any bleeding, and in many that do have bleeding the bleeding could be ascribed to hemorrhoids. The additional procedures mentioned, it is believed, increase accuracy. Moreover, all the additional views are good to have should the technician fail to secure well penetrated films of the filled bowel. It must be remembered that there is no magic in high kilovoltage radiography *per se*. It is only a means of getting through the opaque medium. Compression spots

Presented before the Section on Radiology at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

do this better since excess barium is pushed aside, the permanency and nature of defects are easier to demonstrate, and the defect can be shown in many more aspects. However, spot filming the entire colon is obviously impractical, and therefore the barium enema study of the colon, made translucent by high kilovoltage, is invaluable, for it shows the entire bowel well.

Christie, Coe and Hampton[1] described a technique that relies principally on evacuation films. With it they discovered polyps in 1 per cent and cancers in 1 per cent of a large group of patients. Gianturco does not use evacuation studies. The author finds, however, that many defects disappear after evacuation if they are of fecal or similar temporary nature. Thus reexamination is not necessary to determine whether or not they are permanent. Conversely, the persistence of a defect, at first considered to be merely one of many obviously fecal masses, has on several occasions led to the further investigation which demonstrated that it was caused by a polyp. Sometimes evacuation films actually show the lesion best —usually the larger polyps.

Templeton and Addington[12] described the advantages of siphonage. The author uses the three-way valve developed by Templeton and applies suction by a venturi device on a water faucet. Other radiologists accomplish the same thing with vacuum pumps or even by draining into a bottle or basin.

Details of the method used by the author are:

Preparation. Two ounces of castor oil the evening before examination; no supper, light breakfast and enemas night and morning. (Gianturco's regimen of preparation is similar, but he makes sure that the bowel is clean by having water enemas given until the return is clear.)

The Barium Suspension. U.S.P. barium is mixed with about six parts of water by weight. This mixture was worked out to be dense enough for fluoroscopic visualization but not so dense that it will block the x-ray beam. To the mixture is added 1 per cent tannic acid, and also two tablespoons of methylcellulose (Methocel, Dow 1400 CPS) which has been converted into a jell according to the directions on the package. With this preparation, good evacuation patterns are the rule rather than the exception.

The Examination:

1. Barium is introduced to the descending colon and the flow is then stopped. The patient is rolled up on his left side until the sigmoid colon is well seen and one or two films 10 x 12 in size, are taken with the overhead tube, using 100 kilovolts and appropriate milliamperes at a 40-inch distance.

2. The sigmoid colon and the distal portion of the descending colon are then carefully palpated and observed fluoroscopically. Usually one or two 6 x 8 spots are taken and also eight spots (four on each of two 8 x 10 films) of this region are obtained with maximum compression. (Twelve small spots, it is to be remembered, scatter as much radiation as one 8 x 10 spot.) At this stage the suction apparatus is used to control the desired degree of filling or emptying of the area under observation. Suction makes fluoroscopy easier, good spots are more readily obtained and more of the films will be translucent, showing satisfactory intraluminal detail. If suction had no other value it would be worth while because the patient can be made comfortable; a small amount of barium removed from the distended rectum does the trick. "Accidents" are far fewer.

3. The remainder of the bowel is then examined in the usual fashion and when the barium has passed the ileocecal valve or the appendix has been identified, a spot film of the cecum is made. Some of the barium is evacuated by suction until the haustral folds are fairly definite. Anterior-posterior and posterior-anterior films are then taken, and also a 10 x 12 lateral view of the rectosigmoid region.

4. The patient then goes to the toilet. The previous siphonage seems to aid complete evacuation since there is less for the patient to get rid of. After evacuation, a 14 x 17 post-evacuation posterior-anterior, a 10 x 12 anterior-posterior oblique sigmoid, and a lateral rectosigmoid view are obtained.

5. The films are inspected while wet, and if a persistent or suspicious defect is noted, the area immediately about it is examined if time permits. In any event, double contrast studies are done about two days later in cases on which suspicious looking defects are seen and in all cases in which there is a history of bleeding that cannot be explained on the basis of hemorrhoids or other relatively innocuous lesions. As part of this double contrast study, the sigmoid colon and descending colon are again examined much as at the first examination before the barium is distributed by injecting air.

It will be noted that in the method described, considerable attention is concentrated on the distal third of the large bowel, for most of the lesions are located there. Inasmuch as the incidence of polyps of the large bowel and rectum increases greatly with age—15 per cent of patients over 50 years of age have polyps somewhere in the bowel or rectum—persons in the higher age groups are examined with great care.

DOUBLE CONTRAST STUDY

Some investigators have recommended that a double contrast study be routinely performed instead of a barium enema. This technique, developed principally by Moreton and his associates,[6-11, 14] has merit. The author has performed double contrast studies on practically every patient in whom there was reason to suspect a lesion, and for a while dou-

ble contrast studies alone were used routinely instead of barium enema studies. In the author's experience, however, the double contrast study has proved valuable as a confirmatory method only. Frequently it will demonstrate the lesion quite well, showing it so characteristically there is no chance of mistake. Sometimes it will demonstrate a lesion that cannot be seen by another method. Often, however, only the knowledge of where the lesion is supposed to be will permit recognition of it on double contrast studies. As a matter of fact, skill in detecting a polyp on double contrast films is developed in that way. The double contrast studies moreover seem to have definite advantages in demonstrating lesions proximal to the sigmoid colon, but unfortunately that is not where most of the lesions are. It is discouraging to end up with what appears to be a flawless set of films from the technical point of view, yet have the lesion show up poorly or only once, or perhaps be demonstrated best on the spots taken just before the air is injected. There is a great waste if there is some slip in the technique—too much barium, incorrect exposure—for much time is needed to examine these films with the care that should be given to them.

The double contrast technique used by the author is that described by Jones and co-workers[5, 13] of Stanford Medical School where "Baridol,"® a preparation with colloidal properties, was developed; and the material used is the so-called "gastric" Baridol, not the "colonic." Recently Barotrast,® a similar preparation in powder form developed by Foster, has been used. It is perhaps better generally, although it is not so good as Baridol in the upper gastrointestinal tract. Either of them is better than anything else the author knows of.

In a double contrast study the following views are taken: 14 x 17 anterior-posterior and posterior-anterior views with the tube overhead. Then the tube is shifted so that the x-ray beam will be horizontal across the table, and a right lateral and a left lateral decubitus view are taken. A standing posterior-anterior view, an oblique view of the distal colon, and a lateral view of the rectosigmoid region usually finish the examination. Spots are taken as required. The siphon is used before these films are taken, to remove excess barium from the rectum and lower bowel.

Even with the greatest of care, no one method of examination is effective every time. A technique that worked beautifully on Monday may seem worthless on Tuesday, even though on the second occasion the examiner has the advantage of knowing where to look (or so he thinks). More than once a lesion not recognized fluoroscopically has shown up on spot films; and sometimes it could not be seen even when the area was immediately examined again fluoroscopically, and then was readily seen again in additional spot films of the area. On the other hand, some lesions would be missed if they were not first suspected on the basis of fluoroscopic observation, since the hand can palpate more deeply than the compressor, uncovering the suspicious areas better. Lesions can be suspected fluoroscopically; they have to be confirmed by films.

Other factors that probably affect the accuracy of the "opaque" barium enema examination are:

1. If water is present in the bowel at the beginning of the examination, the barium suspension becomes so thin that a polypoid shadow is completely lost in it, since the medium surrounding the polyp becomes of approximately the same density as the polyp and there is no contrast. This is one objection to using the rather thin barium suspensions some investigators have recommended. The poorer fluoroscopic visibility and evacuation patterns are also objections.

2. Should the barium settle out before films are obtained the polyp will be suspended in water above a layer of dense barium. In this situation it will not be demonstrated because it is surrounded by a medium of essentially the same density, even though the x-ray beam penetrates through the barium column.

3. There is a certain amount of air in the bowel and it will naturally rise to the top. A polyp may lie suspended in a pocket of air above the barium, the barium flowing over the lower surface of the loop in the same way that water flows over a dam. Even should the polyp be coated by barium, it may not be visible, for there may be too little contrast between it and the denser layer of barium below. For these reasons it is desirable to have both anterior-posterior and posterior-anterior films, since with these views there is a better chance of getting a polyp into a pool of barium. This applies to both the opaque barium enema and the double contrast studies. Compression is valuable because a polyp may thus be forced down into the barium on the floor of the loop. The Trendelenberg position can also be used to fill loops which otherwise are partially filled by air, and suction aids in removing excess air and fluid.

4. Sometimes the loops of the distal bowel are not fixed; the arrangement of the loops which was optimal on one day may be an unsatisfactory one the next. Sometimes a sigmoid colon which was noted to loop immediately to the left may, on reexamination, form a small loop to the right before crossing back to join the descending colon. This shift in the position of the loops should be kept in mind when trying to confirm a lesion by double contrast studies. Even the very care with which a patient is reexamined may defeat the purpose, for the bowel is not distended quite so completely on this occasion, and therefore the loops may not rise out of the pelvis to the same degree.

Despite these pitfalls the barium enema made translucent by high kilovoltage and spot films is still the best method for examining the colon for the first time. The double contrast study, on the other hand, is very tricky from the technical point of view. If it is relied on exclusively, polyps and other lesions will be missed. It is a fine examination and certainly should be used often—but after the preliminary barium enema, regardless of what kind of lesion is being looked for.

Most important of all is the principle, "Seek and ye shall find."

2115 Van Ness Avenue, San Francisco 9.

REFERENCES

1. Christie, A. C., Coe, F. O., Hampton, A. O., and Wyatt, G. M.: The value of tannic acid enema and postevacuation roentgenograms in examination of the colon, Am. J. Roent., 63:657-663, May 1950.

2. Gianturco, C., and Miller, G. A.: Routine search for colonic polyps by high voltage radiography, Radiology, 60: 496-499, April 1953.

3. Gianturco, C.: The comparative value of various methods in the roentgenologic examination of the colon, Ill. M. J., 71:67-74, Jan. 1937.

4. Gianturco, C.: High-voltage technique in the diagnosis of polypoid growths of the colon, Radiology, 55:27-29, July 1950.

5. Jones, H. H., Kaplan, H. S., and Windholz, F.: Air contrast colon examination with colloidal barium, Radiology, 56:561-566, April 1951.

6. Moreton, R. D., Stevenson, C. A., and Yates, C. W.: Fictitious polyps as seen in double contrast studies of the colon, Radiology, 53:386-393, Sept. 1949.

7. Moreton, R. D.: Double contrast examination of the colon with special emphasis on studies of the sigmoid, Radiology, 60:510-517, April 1953.

8. Moreton, R. D., Cooper, E. M., and Foegelle, E. F.: A simple one-stage method of double contrast study of the colon, Radiology, 56:214-221, Feb. 1951.

9. Moreton, R. D., and Yates, C. W.: The double contrast study of the colon: A comparative study of barium sulfate preparations, Radiology, 54:541-547, April 1950.

10. Moreton, R. D., and Yates, C. W.: Roentgenologic study of the colon: Value of the double contrast enema, Texas State J. of Med., 45:157-163, March 1949.

11. Stevenson, C. A., Moreton, R. D., and Cooper, E. M.: Nature of fictitious polyps in the colon, Am. J. Roent., 63: 89-94, Jan. 1950.

12. Templeton, F. E., and Addington, E. A.: Roentgenologic examination of colon using drainage and negative pressure: With special reference to early diagnosis of neoplasm, J.A.M.A., 145:702-704, March 10, 1951.

13. Windholz, F., Kaplan, H. S., and Jones, H. H.: Preliminary studies of the gastrointestinal tract with colloidal barium, Calif. Med., 74:155-160, March 1951.

14. Yates, C. W., Moreton, R. D., and Cooper, E. M.: Double contrast studies of the colon with special references to preparation and fictitious polyps, Radiology, 55:539-544, Oct. 1950.

As the Anesthesiologist Sees the Sunset

CHARLES D. ANDERSON, M.D., Oakland

• *Age need no longer be a barrier to operation in view of the expanding knowledge of the care of surgical patients. Blood volumes and blood components can be maintained with replacement therapy. Nutritional and vitamin requirements are better understood and carbohydrates, proteins and vitamins must be given in sufficient quantities to prevent further debilitation during the critical period following operation.*

It has been suggested that the usual pharmacological effects of drugs may not be applicable to elderly patients. The choice of anesthetic agent based on pharmacological effects on younger persons does not necessarily apply to the aged.

NOWADAYS ELDERLY PERSONS are seen in increasingly large numbers in surgical practice. This has resulted from the increased life span that has come about in the past half century. The number of people in this country 65 years of age or older has already exceeded twelve million and with each year there is a further increase.

Surgical treatment has always presented greater hazards for persons in the sunset years of life but the hazards are much less today than a generation ago. Although the training and skill of ordinary surgeons today is better than the training and skill of the outstanding surgeons of a generation ago, it would seem that the reduction of mortality is not alone due to increased technical skills. The improvement in mortality rates for elderly persons following operations has not been so much in the reduction of death in the operating room as in the postoperative critical and convalescent periods.

The lowering of the hazards of surgical intervention for elderly patients has resulted from many factors. Innovation of surgical and anesthetic techniques has played a role but the principal benefit of these improvements so far as patients are concerned is that they permit more adventurous surgical procedures. Early ambulation also has been helpful. However, the major factors in decreasing the hazards of operation have come and are continuing to come from the research laboratories—first in the form of products with specific medicinal properties and second, but much more important, in the form of information of the many complex physiological processes in health and disease. This latter factor is the key that opens the door to another day for many elderly patients.

In obtaining perspective of the elderly patient, chronological age is unimportant compared with an estimation of physiological age. The degree to which degenerative changes and the scars of previous or continuing disease processes have replaced functioning cells in the organs and tissues of the body is an infinitely greater index of the risk of a surgical procedure than mere age in terms of years. Some of the changes in cellular structure resulting from disease or degeneration are relatively unimportant with regard to risk to the patient during anesthesia and operation, whereas others are of paramount importance, such as those in the cardiovascular system, the respiratory system, the kidneys and the liver.

The cardiovascular system must be singled out primarily as the interchange system of the body. It is the highway that provides the cells with oxygen, without which such organs as the brain, the heart, the kidneys and the liver cease to function; that carries the protein building-blocks and the sugars for the anabolic functions of the cell; that distributes the hormonal components that control cellular activity; that has available the components for the clotting mechanism; and that carries salts so necessary for cellular function.

Disease and degenerative processes may so affect the cardiovascular system that its compensatory mechanisms are weakened. But this does not mean that the patient is to be denied the benefits of surgical treatment. It does mean, however, that the patient with a history of myocardial infarction must have adequate pulmonary ventilation and circulation not only during the operative procedure but also during the convalescent period. It means also that hypertensive patients must be kept in a hypertensive state since a lowering of blood pressure may lead to thrombosis and/or embolism, while a sudden increase in blood pressure may result in a cerebrovascular accident. And it does mean the avoidance of prolonged hypotensive states since the decreased flow of blood deprives such organs as the brain, heart, kidney and liver of an adequate supply of oxygen. Such hypoxia may result in coma, hemi-

Presented before the Section on Anesthesiology at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

plegia or depression of such vital centers as the respiratory and cardiac centers in the brain, or in cardiac arrhythmia or cardiac failure, or in cessation of function of the kidneys with the resultant piling up of catabolic products in the bloodstream and the loss of the regulatory mechanisms controlling the concentrations of anions and cations in the circulation, or the inhibition of detoxification processes in the liver.

Degenerative processes in the respiratory system are chiefly fibrotic in nature, accompanied by loss of elastic tissue; and very frequently there is some degree of atrophic emphysema. The patient is a respiratory cripple to the degree that those changes are present. The advantages of an oxygen-enriched atmosphere for these patients is obvious, but even more important is the need for adequate ventilation to permit normal gaseous exchange at the alveolar level.

Degenerative changes or the scars of previous disease may leave the kidneys and liver with impairment of function. In these circumstances it is necessary to maintain homeostatic conditions during operation and convalescence, particularly with regard to oxygenation and adequate circulation.

The maintenance of homeostatic conditions in the vascular system necessitates some understanding of water and electrolyte distribution in the body. Water balance in the body represents a balance between intake and output. The kidneys are the main organs concerned with output of water and under normal conditions the kidneys can successfully keep the vascular system within normal or tolerable limits even though there is a large intake of water. However, in the presence of pathological changes such as occur with hypertensive arteriosclerosis, the ability of the kidneys to handle a large intake of water may be impaired and result in edema. Many other disease processes, of course, may produce edema and in each case the edema is the result of lowered osmotic pressure of the circulating plasma accompanied by a decrease in plasma protein. The effect of the diminished osmotic pressure is to reduce the transfer of water from the interstitial spaces to the vascular system, and the effect of the reduced plasma protein is to cause the kidneys to retain water and salts. A vicious circle is instituted.

Water deprivation, on the other hand, is immediately compensated by withdrawal of water from the interstitial spaces. With continuing loss of water from lungs, skin, intestines and kidneys during water deprivation, there is also loss of water from within the cells. The cells respond to this by catabolic processes on the fats, carbohydrates and proteins which break down into water and acid metabolites. The hypovolemia so produced delays the excretory functions of the kidney and the acid metabolites build up in the vascular system as an increase in non-protein nitrogen. Peripheral vascular collapse results from profound hypovolemia.

Complicating the changes in water balance are the changes in electrolytes that are contained in the various water compartments of the body. Sodium is chiefly concerned in the plasma and interstitial compartments, whereas in the cells potassium is the main cation. To a large extent the concentration of sodium determines water balance, since the kidneys try to maintain a normal sodium concentration by excreting or retaining the material. A rise in the sodium concentration stimulates the secretion of antidiuretic substances by the pituitary gland, which stimulates the kidneys to reabsorb water and thus lower the sodium concentration. A fall in sodium concentration stimulates the secretion of steroids from the adrenals, which brings about a reabsorption of sodium by the kidneys to raise the sodium concentration of the blood.

Although potassium is the chief cation of the intracellular space, potassium is also present in low concentration in the plasma and interstitial space. Potassium, unlike sodium, is not adequately retained within the body. As a result, during fasting, vomiting, diarrhea or prolonged gastric suction, the potassium level tends to fall. The signs of hypopotassemia are chiefly cardiac, and characteristic changes in the electrocardiogram take place as degenerative changes proceed in the myocardium. The correction of potassium deficiency must be brought about slowly, for a sudden increase in the potassium concentration in the plasma above a critical point may induce cardiac arrest.

The problems of water and electrolyte balance in elderly patients must be evaluated in terms of the patient's physiological age and whatever pathologic condition is present. Intake of fluid from all sources should not exceed the output by all avenues. Particular consideration must be given to patients with known cardiac disease to prevent overloading of the myocardium by excessive fluid. Special attention must be given also to patients with kidneys that do not concentrate urine and who therefore need proportionately larger volume of fluids to get rid of metabolites. The salt intake is best restricted, except in cases of definite loss, to about 5 gm. of sodium chloride a day to prevent excessive rise in sodium and chloride levels. In addition, sodium and potassium levels are reciprocal and high sodium intake will tend to produce hypopotassemia.

The nutritional aspects of surgical intervention must be recognized, and in elderly persons close attention to nutritional needs is particularly rewarding.

Hypoproteinemia is a major enemy of elderly patients following surgical operation. The loss of

protein may be considerable, resulting from atrophy of disuse, from toxic destruction of protein, from loss by hemorrhage and from protein catabolism to meet caloric needs.

In the preparation of a patient for operation and in the management of him in the postoperative period, it is mandatory that the intake of nitrogen equal or exceed the nitrogen loss. Such a positive nitrogen balance will yield benefits such as better wound healing and decreased incidence of wound dehiscense, greater motility of the gastrointestinal tract, avoidance of edema, greater cardiovascular stability and improved liver function.

The maintenance of a positive nitrogen balance is best accomplished by oral feedings. Where such therapy is contraindicated, parenteral administration must be used. The best substances for parenteral use for this purpose are whole blood, plasma and serum albumin. However, proteins for parenteral administration are also available for maintenance of a positive nitrogen balance.

The carbohydrate intake serves a useful purpose for the patient in supplying basal caloric requirements, but, much more important, carbohydrates protect the patient's protein reserves from catabolic activities. The administration of 100 gm. of carbohydrate in conjunction with parenteral proteins may provide a positive nitrogen balance.

Vitamins are important nutritional aids. Vitamins B and C are rapidly used up by the body. The components of the vitamin B complex are required in large amounts to utilize parenteral glucose. Also, the detoxifying functions of the liver are dependent on vitamins. If there is a deficiency of vitamins, body protein is catabolized to provide the liver with these detoxifying catalysts. In the absence of vitamins, so much protein is destroyed that it is impossible to maintain a positive nitrogen balance.

In the use of anesthetic and analgesic agents on elderly patients, constant vigil must be kept against overdosage. The depression from such overdosage in a patient with cardiovascular disease can impair the functions of the cardiovascular system, particularly in the supply of oxygen to vital centers and organs. Since the heart is one of these vital organs, a vicious circle of further depression of cardiac activity can quickly be started. For patients who are "cardiovascular cripples," hemodynamic stability and abundant oxygen are imperative.

The differing effects of drugs on patients of different physiological age has never received much attention. Yet it is known that the depressant properties of some narcotics are greater in the very young and the aged. Also, it is common knowledge that scopolamine, while possessing a euphoric property for patients in the 20 to 60 age group, may in equivalent doses produce extreme excitement in persons of greater age. In a recent study[1] on the effectiveness of Dramamine in controlling postoperative nausea and vomiting, a difference of effectiveness related to the age of the subject was noted. In patients under 60 years of age, Dramamine reduced the incidence of postoperative nausea and vomiting by about 27 per cent as compared with a control group. But in patients over 60 years of age there was a reversal of effect; the incidence of nausea and vomiting was greater in patients given Dramamine than in the control series.

Ether has long been considered a safe anesthetic agent since very little disturbance of cardiovascular dynamics or of liver and renal function has been observed in connection with its use. However, recent research by Brewster and co-workers[2] showed ether to be a direct depressant of the myocardium in animals, and it was observed that the beneficial effect of ether on the cardiovascular system is due to the sympathomimetic effect of the drug—direct stimulation of sympathetic nerve endings and the adrenal medulla.

In elderly persons the aging process or disease may produce atrophy or depression of the adrenal or pituitary glands, and in such circumstances ether would act only as a myocardial depressant with perhaps fatal results. In the light of these observations, smugness or complacency about the use of ether as the anesthetic of choice in elderly persons is unwarranted. It is possible that other drugs may possess inherent dangers for elderly patients due to differing pharmacological effect with age. If such pharmacological eccentricities exist, it will be up to anesthesiologists as pharmacological clinicians to prove it.

Merritt Hospital, Hawthorne and Webster Streets, Oakland 9.

REFERENCES

1. Anderson, C. D., Anderson, B. M., Clark, M. A.: Postoperative nausea and vomiting—Part II: Effectiveness of Dramamine, to be published.

2. Brewster, W. R., Jr., Isaacs, J. P., and Wain-Andersen, T: Depressant effect of ether on myocardium of the dog and its modification on reflex release of epinephrine and nor-epinephrine, Am. J. Physiol., 175:399-414, Dec. 1953.

Atypical Laryngeal Lesions

Problems in Diagnosis

GORDON McCOY, M.D., San Francisco

• A small percentage of cases of laryngeal disease may present an atypical appearance on the routine methods of laryngeal examination. The atypical appearance is usually due to situation of the lesion in whole or in part beneath an intact mucosa. All available methods of diagnosis should be used in these cases in an attempt to establish the correct diagnosis and to formulate a plan for treatment. Tomography, aspiration and exploratory thyrotomy are of value in such cases.

IT IS FORTUNATE both for patients and physicians that hoarseness is so often the initial symptom of laryngeal disease, and fortunate too that it is usually evident during the early stages of the disease. The hoarseness may be due to any number of affections such as acute infection, benign lesions, malignant growths, paralysis, granulomas and trauma. Competent laryngologists have little difficulty in differentiating and diagnosing the majority of these lesions by the usual methods of laryngeal examination. In a small percentage of cases, however, diagnostic problems are posed. These cases present an atypical appearance which is due in most instances to situation of the lesion entirely or in part below the mucosa. In such circumstances the distortion of the larynx produced by the disease, as observed upon routine examination, is confusing and often misleading with regard to the true nature of the condition. Carcinomas and cysts make up the majority of lesions of this kind. Such atypical laryngeal pathologic conditions demand a high degree of diagnostic acumen and the intelligent use of all diagnostic aids and methods available.

There are three diagnostic aids which have been found to be of particular value in the diagnosis of atypical forms of laryngeal lesions: (1) X-ray, or, more specifically, tomography; (2) aspiration; (3) thyrotomy.

Tomography has been proved to be a useful adjunct in the study of diseases of the larynx. Its usefulness is often not fully appreciated. Since facilities for the procedure are now available outside the teaching institutions and research laboratories, physicians generally might well acquaint themselves with the technique, understand the fundamentals and have some concrete idea as to what information may be obtained from its use.

Figure 1 (*left*) is a tomogram of a normal larynx in phonation. The air columns of the trachea, ventricles and hypopharynx can be readily identified. The true cords are seen in approximation with the false cords above. Figure 1 (*center*) presents pronounced thickening of the right true cord with obliteration of the normal right ventricle. Clinically this was a case of carcinoma involving the right true cord with extension into the right ventricle. Figure 1 (*right*) shows pronounced edema of all laryngeal structures with a loss of detail and a large subglottic mass on the left side. This was from a case of carcinoma following extensive irradiation with edema of the glottis. The subglottic mass on the left represents a subglottic extension of the carcinoma.

The value of tomography is further emphasized in the following case:*

CASE 1. A 58-year-old physician had a history of intermittent hoarseness of seven weeks and of complete aphonia for a week before examination. Upon indirect laryngoscopic examination pronounced fullness of the left side of the larynx was noted. This distortion involved the entire left false cord, left ventricle and left aryepiglottic fold with a resultant limitation of motion of the left true cord. On the basis of a strong clinical impression that the conditions observed were owing to a submucosal cyst, aspiration by indirect laryngoscopy was done at the initial examination. Approximately 4 cc. of turbid thick material was aspirated. Tomograms revealed the true nature of the lesion. Figure 2 shows the large submucosal cyst filling the entire left half of the larynx. This cyst in its entirety was excised endoscopically, using the Lynch suspension technique.

The second aid in diagnosis—aspiration—was used to an advantage in the foregoing case. In ordinary circumstances, this is done endoscopically and may be done by direct or indirect laryngoscopy. The aspirated material may be cultured, examined on direct smear or subjected to cytologic study. Occasionally valuable information may be obtained from the material removed on aspiration.

Presented before the Section on Eye, Ear, Nose and Throat at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

*From the records of Lewis F. Morrison, M.D., who consented to presentation of the case here.

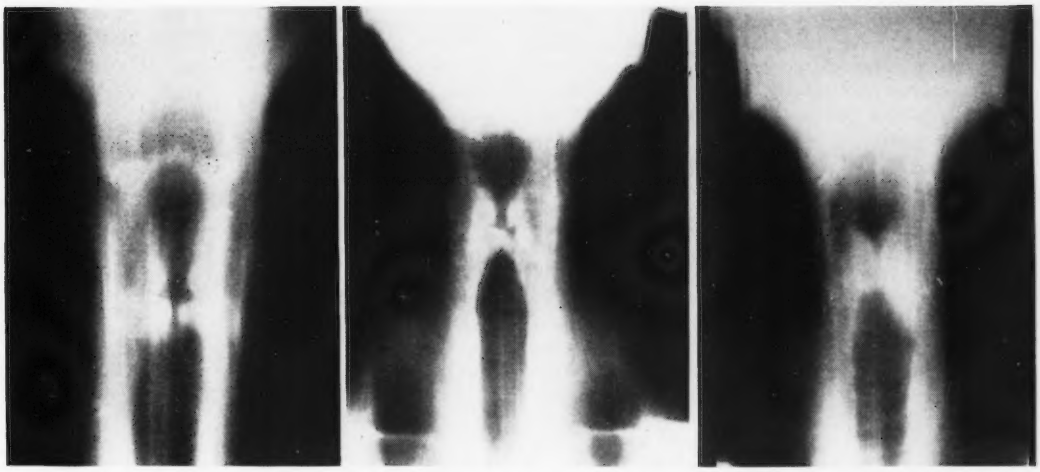


Figure 1.—*Left*, tomogram of normal larynx in phonation; *center*, tomogram of larynx showing a thick right true cord and obliteration of the right ventricular air space. Clinically diagnosed as carcinoma; *right*, tomogram of a larynx following irradiation for extensive carcinoma. There is edema with a loss of detail and a subglottic mass on the left side.

The third aid in the diagnosis of atypical laryngeal lesions is the judicious use of thyrotomy as an exploratory diagnostic procedure. It is an accepted fact that laryngeal cancer in its various forms cannot be diagnosed by clinical impression alone. Histological examination of the diseased tissue is the only way in which the diagnosis is certain. Even then, it must be ascertained that the tissue examined microscopically is representative of the disease. Sometimes it is not, either because the biopsy specimen was not removed from the diseased tissue or because the pathologist did not obtain a slide in the proper plane to demonstrate the disease. In a recent statistical analysis it was noted that in 14 per cent of the proved cases of laryngeal cancer in a series of 260 the first biopsy was negative for the disease. Although cancer cannot be diagnosed by clinical impression alone, proper weight should be given to it. If the clinical appearance or behavior of a lesion suggests malignancy, it is the responsibility of the laryngologist to prove conclusively that it is not—if it is not. One "negative" biopsy, or occasionally three or four, may not do this. Therefore, it is felt that thyrotomy with exploration and direct biopsy is indicated in the occasional case in which carcinoma is strongly suspected clinically and has not been proved by the usual methods. Thyrotomy is recommended under the following conditions: (1) A conscientious effort must have been made to obtain a positive biopsy endoscopically. (2) An adequate pathological sectioning in all planes of the tissue removed endoscopically must have been assured. (3) A consultation with another laryngologist must have confirmed the clinical impression. Finally, preparations must have been made to proceed instantly with the definitive treatment if examination of frozen sections substantiates the clinical diagnosis. The following two cases demonstrate the use of thyrotomy as a diagnostic procedure.

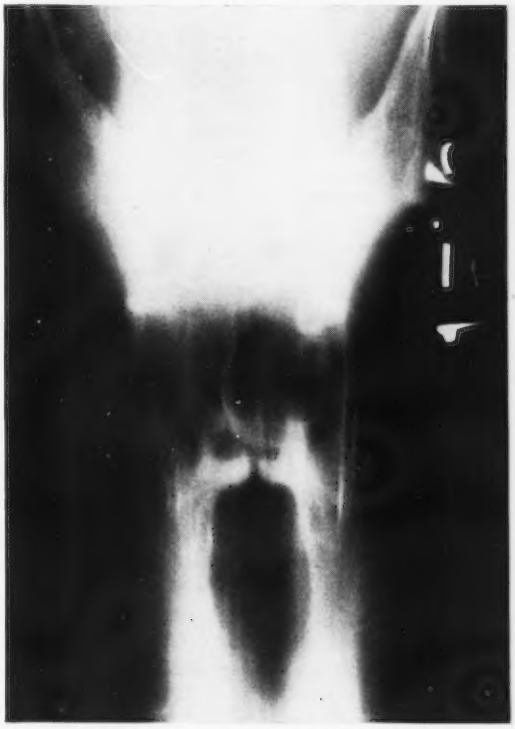


Figure 2 (Case 1).—Tomogram of larynx showing a large submucosal cyst involving the left side of the larynx and hypopharynx.

Case 2. A 48-year-old man was admitted to hospital with progressive hoarseness of two months' duration. Indirect laryngoscopy on admission revealed generalized engorgement of the vessels of the larynx, with a fullness of the left false cord making visualization of the true cord impossible. The impression was that the patient had chronic laryngitis and he was treated accordingly. Improvement was slight. After ten days the larynx was examined directly and a biopsy specimen was taken from the region of the left ventricle and the left false cord. A report of chronic inflammation was returned. Direct laryngoscopy was carried out again six weeks later and again two months after the initial examination. The fullness of the left false cord and the ventricle persisted but no ulcer or proliferative growth was noted. Biopsy specimens taken from tissues as deep as the instruments permitted were negative on both occasions. Papanicolaou preparations of aspirated contents were negative.

Two and one-half months after the initial examination a node appeared in the left side of the neck which, on removal, showed metastatic squamous cell carcinoma. A search for the primary lesion included other areas such as the nasopharynx, sinuses and chest. These were all normal. Almost three months after the first examination thyrotomy was performed and a large submucosal squamous cell carcinoma was demonstrated and proved by frozen section. At the same sitting, total laryngectomy and a left radical neck dissection were done. Figure 3 shows the larynx with the carcinoma opened. Two years later there was recurrence on the right side of the pharynx and on the base of the tongue. This lesion was excised and radical neck dissection on the right side was performed. The patient died four years after the original operation of a traumatic cerebrovascular accident. Cancer was not observed at autopsy.

This case illustrated four important points.

1. The diagnosis of a primary submucosal squamous cell carcinoma of the larynx can be difficult. For two and a half months cancer was suspected, but the decision for thyrotomy was delayed until after the metastatic node appeared in the neck. No doubt, valuable time could have been saved if thyrotomy had been done two months earlier. In this particular case, the delay of two and a half months was not catastrophic, but in some cases it might well be.

2. The value of the thyrotomy with exploration and frozen section was demonstrated. Three negative biopsies were obtained before it was decided to open the larynx.

3. Experience has shown that for primary submucosal carcinoma extensive operation is necessary. There is a tendency to underestimate the size and extent of such a submucosal lesion. Metastasis to regional lymph nodes appear early. In this case laryngectomy and bilateral neck dissections were necessary for cure. The laryngectomy and the left neck dissection was not done *en bloc*. It is now acknowledged that *en bloc* operation offers decided advantages.

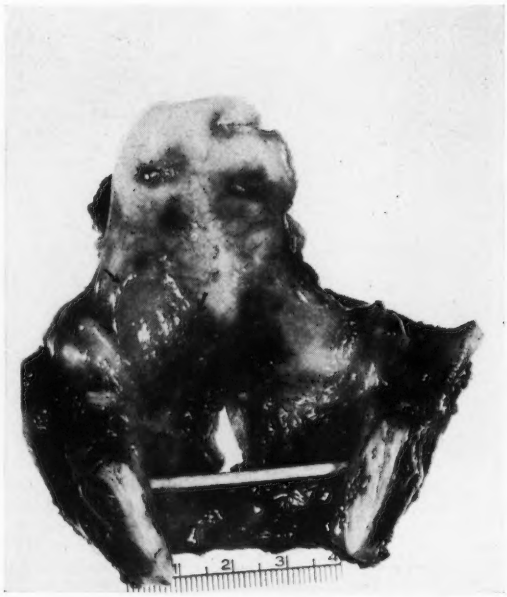


Figure 3 (Case 2).—Operative specimen showing area of exploratory thyrotomy and submucosal carcinoma on left.

Figure 4 (Case 3).—Operative specimen one week after laryngofissure. Operative site and opened submucosal carcinoma are shown.

4. Thyrotomy as a diagnostic procedure must always be followed by definitive operation at the

same sitting. The diagnosis must be proved by frozen section and the necessary operation performed at the same time, as was done in the case cited. A delay of even a week between the two procedures may be disastrous. Such a delay occurred in the following case.

CASE 3. The patient, a 57-year-old man, had had hoarseness for a year. Indirect laryngoscopy revealed a bulging left false cord and ventricle which obscured the true cord from vision. The report on a biopsy performed elsewhere was "squamous cell carcinoma." Direct laryngoscopy and repeated biopsy did not demonstrate cancer. Because of the previous positive biopsy and because of experience with a previous case (Case 2 reported herein) thyrotomy was done immediately. A submucosal carcinoma embracing the true cord and extending into the ventricle was observed. Frozen section examination substantiated the diagnosis. The lesion was resected by the laryngofissure technique. The pathologist's examination showed that the margin of resection was not adequate and a week later total laryngectomy was performed. Figure 4 shows the operative specimen with the surgical defect from the laryngofissure. Two years later metastatic nodes developed in the left side of the neck. A left radical neck dissection was done and the immediate result was satisfactory. One year later, however, the patient died as a result of extensive metastasis in the mediastinal lymph nodes and lungs.

It is entirely possible that the first biopsy taken in the above case, which was reportedly positive, contained the entire part of the cancer that extended to the mucosal surface. It is always good policy to insist on one's own biopsy, or at least the opportunity to review the pathological sections of biopsy elsewhere. Refusal to accept a written report should not be interpreted as being distrustful or discourteous. The tendency of submucosal carcinoma to be deceiving in its extent is illustrated in the foregoing case. It was so deceiving that resection so inadequate as laryngofissure was carried out. It is now a widely accepted fact that laryngectomy followed at a later date by a neck dissection for metastatic spread produces poor results.

490 Post Street, San Francisco 2.

REFERENCE

1. Kirchner, John A.: Carcinoma of the larynx, Arch. Otolaryng., 58:19-30, July 1953.

Congenital Diaphragmatic Hernia

BURTON E. ADAMS, M.D., San Leandro

• Treatment of congenital diaphragmatic hernia in infants is a matter of semi-emergency and should be done as soon as adequate preparations can be made because sometimes fatal complications develop swiftly. In preoperative preparation there is great advantage in thorough decompression of the abdominal viscera, stomach, bowel and bladder. As to operation, the author believes the abdominal approach has most to recommend it. In the postoperative period, continued gastric suction for a brief time, parenteral administration of fluids and use of a Mistogen tent with a high moist oxygen content will facilitate rapid recovery.

ANY PHYSICIAN dealing with infants and children, whether he be obstetrician, pediatrician, general practitioner or surgeon, should be cognizant of congenital diaphragmatic hernia. The condition should be kept in mind as a possible cause of a bizarre variety of symptoms and one which needs prompt correction. For surgeons, who usually see the patient after the diagnosis is made, certain technical aspects of handling the baby are of particular importance.

Congenital diaphragmatic hernias arise as a result of incomplete fusion of the segments of the diaphragm. Early in the development of the embryo, there is free communication between the thoracic and abdominal cavity. The diaphragm develops from a ventral and a dorsal aspect. The ventral portion originates from the septum transversum, arising originally in the neck at the level of the third cervical vertebra from the third and fourth cervical myotomes, and migrates caudad, taking with it its nerve supply. A dorsal portion develops from the dorsolateral abdominal wall and grows to meet the ventral portion. Separation of the two cavities is completed by about the third month of intrauterine life. The last to fuse is a posterior-lateral area called the foramen of Bochdalek. It is bridged across first with a pleura and peritoneal membrane between which muscle fibers later migrate, forming a solid closure. If development stops before this membrane is formed, an opening remains and there is no hernial sac present. If development proceeds through the formation of the membrane, any viscera in the thorax will be covered by a hernial sac.

Another potential area of herniation is that on either side of the sternum where the foramen of Morgagni may form if the costal and sternal fibers of the developing diaphragm fail to fuse. The other weak spot is that of the esophageal hiatus where either the diaphragm may fail to develop or the stomach may fail to completely descend. In the latter two sites the congenital hernia usually has a peritoneal sac.

The most important factor in diagnosing congenital diaphragmatic hernias is to consider such a condition in differential diagnosis. The cardinal signs of cyanosis, dyspnea or vomiting occurring in an infant should immediately arouse suspicions of this condition. However, as was pointed out by Donovan,[3] any perplexing upper abdominal, respiratory or cardiac symptoms should bring this possibility into consideration, for the symptoms vary to so pronounced a degree. They may result from either interference with function of the herniated viscera or from pressure on the heart or lungs. The latter may be very acute and suddenly fatal. The reported symptoms include failure to gain weight, cough, difficulty in breathing and signs of intestinal obstruction. (In the case herein reported, the first unusual thing the parents of the patient noticed was that the abdomen "seemed to beat like a heart," owing to a very rapid respiratory rate and depression of the abdomen with each inspiration.)

The diagnosis can usually be made by clinical examination. As is so often the case, just looking at the patient turns suspicion toward the diagnosis, which then leads to search for less obvious confirmatory signs. One who is used to examining babies is struck by the small abdomen with contours like those of an adult instead of the round protuberant abdomen of the usual baby. Also commonly noted is the rapid respiratory rate owing to the small volume of tidal air. The confirmatory signs consist of evidence of shift of the heart, diminished or absent breath sounds and unusually plain peristaltic sounds on one side of the chest.

An x-ray film of the chest will confirm the diagnosis and a lateral view may aid in showing where the defect is. (On initial examination of the x-ray films of the patient in the case here reported, it appeared that most of the left diaphragm was gone and a swallow of barium was given to confirm or

Presented as part of a Panel on Pediatric Surgery before the Section on General Surgery at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

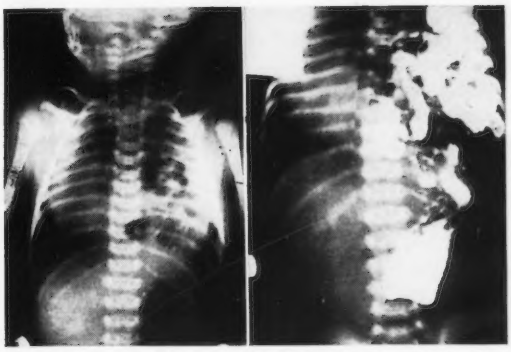


Figure 1.—*(Left)* Shift of mediastinum to right and intestines in left thoracic cavity. *(Right)* After oral administration of barium.

disprove this impression so that the condition could be prepared for at the time of operation.)

REPORT OF A CASE

A four-week-old boy was taken to a physician because of his mother's observation that "his abdomen beat like his heart." Delivery had been normal and the baby had had no apparent difficulty during the first few weeks of life.

Fluoroscopy was done as part of a routine examination and abnormalities were seen in the left lung field. The diagnosis was made by roentgen evidence (Figure 1). The baby was referred to the author and, as he was not in distress, a more complete study before proceeding with surgical repair was decided upon. In an upper gastrointestinal tract series extensive migration of the stomach and the small and large bowel into the left thoracic cavity were observed (Figure 1). The films also gave a good idea of the defect. The baby was scheduled for operation, but before he was admitted the mother telephoned on two occasions to say that the baby had momentary choking spells after eating. One night she telephoned frantically that the baby was choking and bluish. Even as she was talking, the physician who had examined the baby in the first place, who had been summoned, arrived and relieved the child by aspirating the stomach. The baby was then brought into the hospital where examination showed an apparently normal baby, except that the abdomen was flat rather than protuberant. The left side of the chest was dull to percussion, and over it peristalsis was plainly audible. The stomach tube was left in place and suction was applied to it while the patient was being prepared for operation.

Under intratracheal anesthesia the abdomen was opened through a left paramedian incision. The stomach doubled back on itself and entered a defect in the left posterolateral portion of the diaphragm with a portion of the stomach, small bowel and part of the large bowel up in the left side of the chest. A catheter was slipped through the defect into the chest to permit air to enter and break the suction, and the bowel was reduced onto the abdominal wall. This gave an unobstructed view of the defect in the diaphragm lying directly beneath the upper portion of the incision. The defect was about 5 x 3½ cm. with smooth edges and no hernial sac. At first there appeared to be no posterior diaphragm at this point to use for repair, but a little dissection behind the diaphragm freed a quite adequate layer of muscle which had lain against the posterior wall. The smooth margins of the defect were freshened and a closure was done with mattress sutures. As the last suture was placed, a catheter was again passed through the remaining space. When the anesthetist had inflated the left lung thoroughly, the catheter was removed and the last suture tied. As the intestines were being put back into the abdominal cavity, a mass was noted which occupied about half the space in the pelvis. It was merely the bladder filled with urine. At the end of the operation a catheter was inserted into the bladder and although only one ounce of urine was released, that small volume took up a large proportion of the available space in the tiny abdomen.

Immediately after operation there were breath sounds of good quality over the left lung field and only slight abnormality of percussion note. The left lung was adequately expanded and as there was little pneumothorax aspiration was not done on that side of the chest. Gastric suction was continued for 12 hours and the postoperative course was smooth until the twelfth postoperative day when a strangulated right inguinal hernia had to be repaired.

Preparation for operation should be started as soon as a diagnosis is made. The situation is one of emergency and not of elective operation. Seventy-five per cent of babies treated expectantly die within the first month.[8] Except for, possibly, premature infants, no baby is too young for operation. It was Dr. Ovar Swenson who said, relative to surgical procedure, "A baby is like my new car—it will never be in better condition."

Besides the usual routine preparation of replacing fluid and electrolytes, another important step is to prepare the viscera by making them as empty as possible. The experience in the case herein reported, in which one ounce of urine took up so much space in the baby's underdeveloped abdomen, prompted investigation of the possibility of further reducing the visceral volume to facilitate closure in cases of that kind, as well as patients with omphalocele. For this purpose, newborn babies were weighed at birth and again after the first passage of a stool. The amount of stool and urine passed by 7-pound babies was 2½ to 3½ ounces—a relatively large volume in a small baby with an abdomen not developed to contain all the intestines. Hence, use of three catheters in preparation for operation is recommended: Gastric suction, a urethral catheter, and a rectal tube to evacuate the lower bowel by enema if something simple like a suppository has not brought about preoperative bowel movement.

Of first consideration in operative procedure is

anesthesia. Provision should be made for positive pressure anesthesia either by intratracheal tube or face mask so that respirations can be maintained while the chest is opened and the lung can be expanded at the close of operation. The anesthetic agent should contain a high oxygen concentration, for there may be only a small amount of functioning lung tissue initially.

As to surgical approach, the author recommends the paramedian or rectus incision. The advantages are numerous. The opening is directly over the defect, providing very good exposure. All the intestines can be reduced outside the abdominal cavity so that there is no interference with the operative field. The viscera reduce readily for they are not adherent within the thoracic cavity but are lying loose, as they do in the abdomen of a normal child. With the abdomen opened any defect in rotation of the bowel, a not uncommon associated abnormality,[6] can be dealt with at the same time. Finally, the abdominal approach permits use of two-stage closure of the abdominal wall in difficult cases: undermining the skin and closing only the outer layer, then in five or six days, when the abdominal wall has stretched, doing a layered closure.[5]

An alternate approach is through the chest,[10, 11] suggested by its proponents as quicker in emergencies. With this view the author cannot agree. It is also more difficult to close a diaphragmatic defect from above owing to the interference of intestines in the tight abdomen.

The author also takes exception to investigators who advocate phrenic crush.[6, 11] The advantages are said to be that it makes it easier to close the opening with a quiet diaphragm on which to work; a relaxed diaphragm supposedly gives more room in the abdominal cavity, and there is less pull on the suture, so healing is promoted. On the contrary, there is little difficulty in suturing a moving diaphragm. Moreover, if the surgeon desires it, a skilled anesthetist can control respirations by controlling the carbon dioxide content of inspired gas. Also, frequently in operations on adults the innervated and active diaphragm is sutured and it heals readily. Finally, it may be wondered if the respiratory distress mentioned as resulting from increased intra-abdominal pressure is not sometimes the result of a paralyzed diaphragm rather than of a tight abdominal wall. All these considerations, plus consideration of the sometimes large amounts of mucus in babies' throats, seem to weigh heavily against phrenic crush.

Reduction of the herniated viscera should be orderly; the bowel should be withdrawn first, then the spleen or liver if involved. Reduction is facilitated by permitting air to enter the pleural cavity either by means of a catheter inserted through the defect or by use of a retractor. One should not hesitate to split the diaphragm further, if that is indicated, to withdraw the spleen or liver. Adhesions are reported as rarely encountered.

Closing the defect of a posterior lateral hernia consists of freshening the edges and approximating them with a single or double row of interrupted figure 8 sutures. In the case of herniation through the foramen of Morgagni or the dome of the diaphragm, after the sac is reduced a similar closure is done. In all these areas the spleen or liver helps to buttress the suture line. It is well to keep in mind also that the diaphragm runs parallel to the posterior abdominal wall for a considerable distance; in fact, since some of its fibers arise as low as the fourth lumbar vertebra, additional diaphragm can be freed for bridging the defect by dissecting this portion from the posterior and lateral wall. Rectus fascia, renal fascia or fascia lata are sometimes used to bridge large defects, and still another method is to partially collapse the lower thoracic cage by sectioning or removing sections of the ribs on the involved side.

The lung is expanded by the anesthetist just before the diaphragm is closed. At the conclusion of the operation a check is made for persistent pneumothorax and, if necessary, air is aspirated through a needle. Sometimes the lung does not expand immediately, but surgeons who have operated through the chest have reported cases in which a carnified lung that did not expand at the time of operation appeared normal by x-ray 24 to 48 hours later.

Postoperative care consists of supportive treatment. The author uses Mistogen tent with high humidity and oxygen content, parenteral fluids, transfusion of whole blood when indicated, and gastric suction until the baby retains feedings.

215 Estudillo Avenue, San Leandro.

REFERENCES

1. Arnheim, E. E.: Congenital hernia of the diaphragm with special reference to right-sided hernia of the liver and intestines, Surg. Gyn. and Obst., 95:293, Sept. 1952.

2. Baumgartner, C. J.: Surgical emergency of diaphragmatic hernia in children, Arch. Surg., 61:170, July 1950.

3. Donovan, E. J.: Congenital diaphragmatic hernia, Ann. Surg., 122:569, Oct. 1945.

4. Gants, R. T.: Diaphragmatic hernia, Ann. Surg., 139: 166, Feb. 1954.

5. Gross, R. E.: The Surgery of Infancy and Childhood, W. B. Saunders Company, Philadelphia, 1953, Chap. 34.

6. Harrington, S. W.: Diaphragmatic hernia of children, Ann. Surg., 115:705, April 1942.

7. Harrington, S. W.: Various types of diaphragmatic hernia treated surgically, Surg., Gyn. and Obst., 86:735, June 1948.

8. Hedbloom, C. A.: The selective surgical treatment of diaphragmatic hernia, Ann. Surg., 94:776, Oct. 1931.

9. Homans, J.: A Textbook of Surgery, sixth edition, Chas. C. Thomas, 1945, chapter 53.

10. Koop, C. E., and Johnson, J.: Transthoracic repair of diaphragmatic hernia in infants, Ann. Surg., 136:1007, Dec. 1952.

11. Ladd, W. E., and Gross, R. E.: Abdominal surgery of infancy and childhood, W. B. Saunders Company, Philadelphia, 1941, chapter 27.

Relation of Nutrition to Health in Aging Persons

A Four-Year Follow-up of a Study in San Mateo County

HAROLD D. CHOPE, M.D., San Mateo

• A follow-up study of 577 San Mateo County residents over 50 years of age who were originally studied in 1948 was carried out. Three hundred fifty still were available for reevaluation. Mortality studies showed a higher death rate in males than in females, in persons of the lower economic levels, and in those with systolic blood pressure of more than 180 mm. of mercury. Correlations between factors studied and morbidity were not conclusive, but suggested relationships between low economic status and digestive system disease; low hemoglobin and high incidence of respiratory disease; high caloric intake and digestive system disease; low thiamine intake and nervous system disease; low ascorbic acid intake and diseases of the circulatory and digestive systems.

DURING THE SUMMER and fall of 1948 and the early part of 1949, a study of the nutritional status of 577 citizens, over 50 years of age, in San Mateo County was conducted with the cooperation of the U. S. Bureau of Human Nutrition and Home Economics, the U. S. Public Health Service, the Department of Home Economics of the College of Agriculture of the University of California, the California State Health Department and the Department of Public Health and Welfare of San Mateo County. A preliminary report of this study was published in February 1951.[1]

Subsequent papers on the nutritional data obtained from the study have been published by Gillum and Morgan[2] and co-workers at the University of California.

The 1948-49 survey in San Mateo County was probably the largest cross-section study of the nutritional status of aged people made to that date. It was the consensus of the persons involved in the study that "longitudinal studies," or repeated examinations of the same subjects, might offer more useful information than the continued observance of new subjects. Funds became available in the spring of 1952 and it was decided to re-survey as many of the original subjects as possible during the summer and fall of 1952.

The same general fields (but somewhat simplified) were included in the second survey. Several items included in the physical examination, found to be of no significance in the original study, were deleted in the second study. It was the opinion of the nutrition experts who worked on the project that as much data could be obtained from the subject's recollection of what he had eaten on a specific day as from a seven-day recorded diet. Therefore, this method was adopted for the 1952 study. In the original study, 14 blood chemical determinations, roentgen study of the chest and a bone-density determination were carried out. In the current study, this bank of tests was reduced to six—determination of the content of hemoglobin, ascorbic acid, vitamin A, carotene, cholesterol and sugar in the blood. The chest x-ray and the bone density determination were not repeated.*

After intensive follow-up procedures, it was determined that there was a potential of 350 of the original subjects examined in 1948 available for interview and examination in 1952. The remaining 225 of the original 577 were unavailable for the following reasons:

Dead (as of September 1, 1952)	49
Not interested, refused	55
Too ill to cooperate	13
Moved out of county	72
Out of county temporarily	15
Uncontacted, all leads exhausted	21
	225

Of the 350 possible candidates for reexamination, 306 actually completed the full schedule including the physical examination, the nutritional history and the laboratory work.

Upon review of local and state records notices of the death of 49 of the original 577 participants were found. Analysis of data concerning the persons who died is given in Tables 1 through 6.

Presented before a Joint Meeting of the Section on Public Health and General Practice at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

*Mr. Richard Handschin, a fourth-year medical student, and the public health nurses of the San Mateo County Health Department were responsible for the follow-up. Dr. Warren Hall did the clinical evaluations, and two nutritionists and a laboratory technician, employed by the University of California, did the diet evaluations and the laboratory determinations.

Although the numbers are small, there is a statistically significant difference between the percentage of deaths in the males and in the females and, as would be expected, in the older age groups as compared with the younger age groups (Table 1).

Age-specific death rates by six general classifications of cause of deaths were prepared (Table 2). By applying the age-specific death rates for the county as a whole to the study group for the four-year period, it was found that the number of deaths in the study group was somewhat less than the expected number of deaths in the group, if the experience for the age groups of the whole county had applied.

The original subjects, when selected in 1948, were all healthy—at least they had no symptoms and were not under medical care. It would be reasonable to expect that in such a group the number of deaths would be less (it was 49) than in the general population (it would have been 73 in the study group if the total county experience had been applied).

The causes of deaths in the 49 subjects are shown in Table 3.

Deaths by economic status were analyzed for the study group. The death rate in the low economic groups was nearly four times that in the middle economic group—22.6 per cent as compared with 5.2 per cent. The percentage of deaths in the high economic group, in which there were only 24 subjects, was very close to the average for the total group—8.3 per cent.

The original 577 subjects were all well at the time of the first examination and none had been under the care of a physician for a period of at least three months. However, 243 (or 42.1 per cent) of the total group were referred to private physicians because of abnormalities noted in the physical examination or in laboratory studies. The list of reasons for referral was detailed in the previous paper. At the end of four years, only 17 (or 5.1 per cent) of those not needing medical attention had died, while 32 (13.2 per cent) of those referred to physicians had died.

There appeared to be a relationship between systolic blood pressure and mortality, as shown in Table 4. The death rate of both males and females with diastolic blood pressure over 100 mm. of mercury was somewhat higher than among those with diastolic pressure below that level, although the correlation was not as pronounced as it was in relationship to systolic pressure.

No striking relationships between the death rate in the group and the following factors were noted: Hemoglobin content of the blood, blood glucose, blood creatinine, caloric intake, protein intake, fat intake, carbohydrate intake, calcium intake, iron intake, or cholesterol intake. However, there appeared to be some relationship between mortality and the cholesterol content of the blood (Table 5).

This finding of a higher percentage of deaths in the group of subjects with low or normal blood cholesterol might seem contrary to the general belief that blood cholesterol bears a relationship to arteriosclerosis and myocardial infarction. However, Gofman and associates at the Donner Laboratory have expressed belief that the total blood cholesterol bears little relationship to the S_f 10-20 class of lipoprotein which they associate with arteriosclerosis. Unfortunately, the ultracentrifuge technique was not applied

TABLE 1.—*Deaths by age and sex—September 1, 1948 to September 1, 1952; 577 subjects, San Mateo County*

Age group	No. in group	Deaths No.	Deaths Pct.	Deaths, males No.	Deaths, males Pct.	Deaths, females No.	Deaths, females Pct.
50-59	192	3	1.6	3	12.9	....	0.0
60-69	214	14	6.5	10	14.4	4	3.5
70 and over	170	32	18.8	23	25.4	9	11.4
Not stated	1	....	.....	....	.....	0	0.0
Total	577	49	8.5	36	12.9	13	4.4

TABLE 2.—*Deaths in study group in four years by age groups compared with expected deaths using total county experience*

Age groups	No. in group	Deaths No.	Deaths Pct.	—Total county experience— Age specific death rate	Predicted deaths in study group No.	Predicted deaths in study group Pct.
50-59	192	3	1.6	11.51	8	4.2
60-69	214	14	6.5	23.61	19	8.8
70 and over	170	32	18.8	77.90	46	27.0
Not stated	1	0	.....	.....	....	.....
Total	577	49	8.5	.....	73	12.6

TABLE 3.—*Causes of deaths analyzed by groups and by sex for 577 subjects—1948 to 1952, San Mateo County*

	Cause of death	Male	Female	Total	Percent from each cause	Total deaths from same cause in population over 50 years of age, percent
(400-468*)	Heart and circulatory	20	5	25	51.0	56.7
(330-398)	Central nervous system and circulatory	3	5	8	16.3	11.1
(140-205)	Neoplasms	6	1	7	14.3	15.5
(470-521)	Respiratory pneumonia	2	1	3	6.1	2.0
(812-)	Accidents	0	1	1	2.0	2.8
	All other causes	5	0	5	10.3	11.9
		36	13	49	100.0	100.0

*Numbers in parentheses indicate Sixth Revision International Statistical Classification numbers.

TABLE 4.—*Deaths in relation to systolic blood pressure and sex; 577 subjects—San Mateo County*

Systolic pressure mm. of mercury	Total group			Males			Females		
	No.	Deaths	Pct.	No.	Deaths	Pct.	No.	Deaths	Pct.
Less than 140	115	5	4.3	67	4	6.0	48	1	2.1
140-179	300	21	7.0	148	18	12.2	152	3	2.0
180 and over	161	23	14.3	65	14	21.5	96	9	9.4
Not stated	1	....	.....	.....	....	.....	1	....	....
Total	577	49	8.5	280	36	12.9	297	13	4.4

TABLE 5.—*Relation of death rate to cholesterol content of blood*

Total cholesterol (mgm. per 100 ml. of blood)	No. of persons	Died	Percent
Less than 220	145	22	15.2
220-279	276	19	6.9
280 and over	148	6	4.1
Not determined	8	2	.....

TABLE 6.—*Relation of death rate to intake of vitamin factors*

	Subjects	Deaths	Mortality	Pct.
Vitamin A (international units)				
Less than 5,000	158	22	13.9	
5,000-7,999	160	11	6.9	
8,000 and over	211	9	4.3	5.4
Not determined	48	7	.....	
Niacin (mg.)				
Less than 10	154	16	10.4	
10-13	196	16	8.2	
14 and over	179	10	5.6	6.9
Not determined	48	7	.....	
Ascorbic acid (mg.)				
Less than 50	130	24	18.5	
50-109	251	9	3.6	
110 and over	148	9	6.1	4.5
Not determined	48	7	.....	
	577	49		

to the specimens of blood from subjects included in the San Mateo County study.

There seemed to be relationships between mortality and the intake of vitamin A, niacin and ascorbic acid. The death rate was greater among subjects with a low intake of these vitamin factors than it was among subjects with a higher intake (Table 6).

No definite conclusions should be drawn from the data. The numbers involved in the calculations were small—577 subjects and 49 deaths. However, the data on deaths after four years did suggest the following:

1. In persons over age 50, the death rate in males is higher than in females.

2. That those in the low economic levels have a shorter expectancy after age 50 than those in the middle or upper economic levels.

3. That patients, particularly males, over 50 years of age with systolic pressures over 180 mm. of mercury, do not have a very favorable prognosis.

4. That low vitamin intake, particularly vitamin A, niacin and ascorbic acid, appear to predispose to a high mortality.

MORBIDITY

As was previously mentioned, 306 persons from the original study were returned for the second evaluation, physical, dietary and laboratory. Of the 306, there were 78 (25.5 per cent) who reported no illness whatever during the four-year period. Two hundred and twenty-eight (74.5 per cent) reported one or more illnesses during the period (average 1.5 illnesses per person). Seventy-two per cent of the males and 77 per cent of the females reported illness. The smallest percentage of illness was in the 60 to 69 age group (71.2 per cent). It was 75.4 per cent in the 50 to 59 age group and 78.1 per cent in the 70 and over group.

The 228 persons reporting illness during the four-year period reported 341 illnesses. Using the Sixth Revision of the International Statistical Classification, these 341 illnesses were classified into five general groups and a sixth group of "all other causes." These five groups (with the parenthetical numbers assigned by the International Classification) were:

Nervous system and sense organs (330-398, 780-781, 790-791).

Circulatory system (400-468, 782).

Respiratory system (470-527, 783).

Digestive system (530-587, 784, 785).

Musculoskeletal system (690-748).

All other (001-326, 590-637, 786-789, 792-795).

The distribution of these 341 reported and confirmed illnesses into these five groups was as follows: Nervous system, 10.8 per cent; circulatory system, 18.8 per cent; respiratory system, 18.8 per cent; digestive system, 14.6 per cent; musculoskeletal, 13.8 per cent; all other, 23.2 per cent. The same percentage distribution was then calculated for the various sub-classifications. Only the apparently significant differences will be reported here. In the age group 50 to 59, respiratory disease accounted for the highest percentage of illness, while in the group 60 to 69 years of age, circulatory disease was high; and in the group over 70 years of age, nervous system disease (probably cerebral hemorrhage) was nearly twice as common as in the groups under 70. Digestive system and musculoskeletal disease accounted for a very few illnesses in the age group over 70.

The incidence of respiratory disease was higher in males than in females, but with regard to the other four disease groups there was remarkably little difference between the sexes.

Disease of the circulatory system was of highest incidence among persons with systolic pressure over 180 mm. of mercury and diastolic pressure over 100 mm., and respiratory tract and digestive tract diseases were highest in those with low (140 mm. or less) systolic blood pressure.

Persons in the low economic group had a considerably lower incidence of nervous, circulatory, respiratory or musculoskeletal disease but a much higher incidence of digestive system disease than did subjects in the middle or upper economic groups.

Among subjects not referred to physicians in the original study there was more nervous system and respiratory disease than there was among those who had been referred, but the incidence of circulatory disease was highest among those who had been referred.

In subjects with low hemoglobin (less than 13 gm. per 100 cc.) there was high incidence of respiratory disease. Among persons with high hemoglobin content (15 gm. per 100 cc. and over), the incidence of digestive system disease was relatively high and of musculoskeletal disease very low.

The higher the caloric intake, the lower the incidence of circulatory disease and the higher the incidence of digestive tract disease. Also, among persons with a high caloric intake (2,600 calories or more daily) the incidence of nervous system disease was very low.

The amount of protein intake seemed to have little effect on illness associated with the nervous system or the circulatory system, but among subjects whose protein intake was in the middle range (60 to 79 gm. a day) the incidence of respiratory disease was high and of digestive and musculoskeletal system disease low.

In subjects with low intake of vitamin A (less than 5,000 international units) the incidence of nervous system, circulatory system and respiratory system disease was high and the incidence of digestive and musculoskeletal system disease was low. Those with a high vitamin A intake (8,000 international units and over) had a low incidence of nervous system disease and circulatory disease, had about the group average of respiratory and digestive system disease, but a high incidence of musculoskeletal system illness.

Low thiamine intake (less than 0.80 mg. a day) seemed to be associated with nervous system disease and circulatory disease; the higher the intake of thiamine, the lower the incidence of disease of these two systems.

Diseases of the circulatory system and the digestive system were associated with low intake of ascorbic acid (less than 50 mg. per day). Among persons with a high intake of ascorbic acid (110 mg. and over) there was a low incidence of nervous system and circulatory system disease.

Two sets of data were available regarding cholesterol—the calculated cholesterol intake and the cholesterol content in the blood. Those with low content of cholesterol in the blood (less than 220 mg. per 100 cc.) showed a high incidence of musculoskeletal disease, but those with low intake of cholesterol (less than 450 mg. a day) showed no remarkable deviation from the group average incidence of musculoskeletal disease. Subjects with a high content of cholesterol in the blood had low incidence of musculoskeletal disease while those with a high dietary intake of cholesterol had a high incidence of musculoskeletal disease. Among subjects with a high level of cholesterol in the blood the incidence of circulatory disease was high, but those with a high cholesterol intake (760 mg. a day or more) had less circulatory disease than the average incidence for the whole group.

No conclusions should be drawn from these stated relationships except that there is an urgent need to carry on further intensive research into the effect of nutrition on the health status of persons over 50 years of age.

225 Thirty-seventh Avenue, San Mateo.

REFERENCES

1. Chope, H. D., and Dray, S.: The nutritional status of the aging, Calif. Med., 74:105-107, Feb. 1951.

2. Gillum, H., and Morgan, A. F.: The nutritional status of the aging. I. Hematology of 577 normal men and women over 50 years of age. (To be published.)

3. Gofman, J. W., Jones, H. B., et al.: Blood lipids and human arteriosclerosis, J. Am. Heart Assn., 2:161-177, Aug. 1950.

4. Gofman, J. W., and Jones, H. B.: Obesity, fat metabolism and cardiovascular disease, Circulation, 5:514-517, April 1952.

5. Gofman, J. W., Lindgren, F. T., et al: Lipo-proteins and arteriosclerosis, J. Gerontology, 6:105-119, April 1951.

Coronary Sclerosis and Coronary Thrombosis

Industrial Aspects Associated with Compensation

WILLIAM L. ADAMS, JR., M.D., Fresno

• The California compensation laws and labor codes make adjudication of industrial coronary disease, for purposes of determining industrial liability, difficult for the attending physician. From medical writings on the subject in the past decade and from personal experience before the Industrial Accident Commission the author draws suggestions for a sounder approach on a physiological and pathological basis. Criteria for use in determining such liability in cases of coronary heart disease due to employment are outlined.

CORONARY ARTERY DISEASE has become more and more closely related to industrial occupation during the last 15 years. As medical science gradually increases the life span of the population, and as there is an increasing tendency not to expect retirement at the age of 65 years, industry becomes more cognizant of the relationship between its employees and their degenerative diseases. It has been estimated by the American Heart Association that somewhere between 750,000 and 1,000,000 attacks of acute coronary occlusion are reported each year, and there are probably many more either misdiagnosed or not observed by a physician.

Before going into the industrial relationship of coronary artery disease, it would probably be well to review and adjust our thinking and terminology with particular reference to angina pectoris, coronary insufficiency, coronary thrombosis and myocardial contusion, and to follow this with the application of such knowledge to industrial situations, recognizing that, while this has been done numerous times by other writers and teachers in this field, the physiology and pathology applied to the clinical picture is important enough to justify repetition.

There have been many changes in the past years regarding concepts of coronary artery disease and myocardial infarction, with reference to origin, diagnosis, treatment and prognosis. Studies on the pathogenesis of coronary sclerosis and arteriosclerosis in general, with particular reference to atherosclerosis, cholesterolemia and certain other lipoproteins in the blood, are proceeding slowly but surely, and it is not the purpose of this paper to further elaborate in this direction. The underlying predisposition to atherosclerosis appears to be in the nature of a metabolic defect involving the biosynthesis, transport and catabolism or excretion of certain lipoids, chiefly cholesterol, as was noted by Gutman[7] and many others. It is probable that future developments along this line will affect for years to come the treatment of patients in the older age groups and patients who have had infarction.

Diagnostic procedures in the clinical studies of angina pectoris, coronary sclerosis and coronary thrombosis have not changed materially in the past decade. The greater use of ballistocardiography, angiography and peripheral arterial surgical operations together with cardiac operations has increased the ability to understand and diagnose underlying vascular states. For many years coronary occlusion was considered a disease of very high mortality, high morbidity and poor prognosis; only recently has come the increased ability to differentiate the various types of coronary artery disease and to recognize the distinguishing features of each. The increasing use of routine electrocardiograms, particularly in pre-employment and life insurance examinations, has been of great aid in uncovering previously unbeknownst coronary artery disease.

Treatment also has undergone many changes during the past few years. Previously many patients diagnosed as having severe heart disease following a single attack of acute pain in the chest were given a minimum of eight to ten weeks of bed rest and were told from then onward to lead a sedentary, quiet and unproductive life. Now it is realized that many of these patients can be returned to their previous occupation, many of them with only four to five weeks of active treatment. The differentiation of so-called "good risk" from "bad risk" cases of coronary artery disease, as described by Russeck[20] and co-workers in a study of 1,047 cases of acute myocardial infarction, has, in the author's personal experience, been extremely useful therapeutically. Using the Russeck statistics, it is pretty well shown that in "good risk" cases the mortality rate is approximately 3 per cent, as against 60 per cent for the "poor risk" cases. These figures apply irrespective of age, and the outlook for a severe or mild attack in an elderly patient is no worse than in a younger

Presented before the Section on Industrial Medicine and Surgery at the 83rd Annual Session of the California Medical Association, Los Angeles, May 9-13, 1954.

patient, the prognosis depending not on the age but on the degree of pathologic change and complications. Most clinicians agree that the use of anticoagulants, by decreasing the complications of embolic phenomena, has definitely decreased the mortality rate in the poor risk cases. While treatment of patients with myocardial infarction varies considerably with the individual physician, it has been the author's practice to continue the use of coronary dilators and mild sedation indefinitely following an acute attack of coronary occlusion of the poor risk type. The recurrence of coronary occlusion in patients so treated, it is felt, has been definitely less than that generally reported in the literature.

Coronary artery disease can be considered in two classifications—acute and chronic. There are two major types of acute coronary disease—acute coronary occlusion and acute coronary insufficiency, which differ from each other both pathologically and electrocardiographically. From the standpoint of therapy and prognosis, it is essential to differentiate these two types of episodes, even though they may simulate each other clinically. Master[15] estimated that 95 per cent of the cases can be differentiated by electrocardiographic patterns. Acute coronary occlusion results from progressive degenerative arteriosclerotic disease, and occurs when a thrombus forms in a preexisting sclerotic artery, either directly on an arteriosclerotic plaque, or secondary to a subintimal hemorrhage in such a plaque. While it has been reported that subintimal hemorrhage may form a hematoma large enough to occlude the lumen without thrombosis, this probably is quite rare. It is an established fact that hemoconcentration, slowing of blood flow, or any factor which makes blood coagulate quicker, favors formation of thrombi in the coronary or any artery, while rupture of a subintimal capillary and plugging of a coronary vessel, due to subintimal hemorrhage, may rarely occur.

When occlusion of the vessel is complete, or nearly so, there is more or less rapid obstruction of a medium sized or large artery by thrombus, which results in a large confluent through-and-through infarct, unless the patient dies very early. Inasmuch as myocardial infarction commonly extends from the endocardium to the pericardium, mural thrombi form, which can cause peripheral embolic complications, and pericardial irritation occurs with the resultant clinically demonstrable typical friction rub.

The clinical symptoms may be quite variable. If severe pain is present, it is usually substernal, precordial and referable to the shoulders, jaw, back, the inside of the arms and frequently to the wrists. Typical electrocardiographic changes are present in this situation, consisting principally of deep Q-waves, early ST elevation, T-wave inversion and continuing progressive changes with eventual permanent abnormalities of the electrocardiographic tracing.

Acute coronary insufficiency, on the other hand, includes several different kinds of acute coronary episodes, the simplest type being that associated with, or producing, angina pectoris which results from a temporary functional inadequacy of the coronary circulation, and pain, as just described. Typical precipitating factors are excitement, exertion, cold, ingestion of food, coitus, and symptoms are promptly relieved by rest and administration of nitroglycerine, with attacks subsiding usually in a few minutes and rarely lasting more than 25 or 30 minutes. If coronary insufficiency persists, however, it brings about myocardial anoxia and infarction of the myocardium with all the signs and symptoms of coronary occlusion. However, in coronary insufficiency the changes in results of laboratory tests are less severe than they are in coronary occlusion, the decrease in blood pressure is not as great, the fever is not as high, the leukocytosis is less and the acceleration of sedimentation rate may appear very late. These modifications are due to the fact that the infarction in the heart muscle is a focal one, with disseminated areas of necrosis, limited to the subendocardium and papillary muscles. Since the pericardium is not involved, the clinical sign of the precardial friction rub is absent, and the similar sparing of the endocardium prevents embolic phenomena more commonly occurring with coronary occlusion. Electrocardiographically, depression of the ST segments with T-wave inversion occurs, Q-waves are absent and electrocardiographic changes frequently last only a few days, the pattern then usually returning to normal.

In the present machine age, and industrially speaking, one must not lose sight of the possibility of direct cardiac injury. Much has been written in surgical journals regarding diagnosis, treatment and prognosis of penetrating wounds of the thoracic cage and of the heart itself; and a decade ago there was considerable literature regarding direct nonpenetrating injuries of the heart. Numerous case reports by Boas,[2] Leinoff,[10, 11] Race[19] and others,[8, 17, 18] called attention to the fact that these injuries might frequently be overlooked because of more obvious thoracic pulmonary lesions. It is interesting to note that, as expected, the electrocardiographic changes in these cases were those consistent with coronary thrombosis, and that in cases in which necropsy was carried out, thrombosis or occlusion of the coronary vessels were absent. The macroscopic and microscopic examinations of the heart muscle showed extensive hemorrhages and patchy interstitial muscle necrosis typical of hemorrhagic infarction, rather than infarction of the anemic type that occurs as a subsequence of coronary obstruction. MacGill[17] and Kissane[9] recently again called attention to cardiac injury of this type.

The foregoing discussion of the pathogenesis of coronary sclerosis, angina pectoris and coronary

contusion, and of the factors producing the onset of coronary occlusion and coronary insufficiency is background for specific consideration of the industrial aspects of these conditions. Physicians interested in this subject are familiar with the work of Master and his associates,[12, 13, 14, 15, 16] who have presented statistical studies stressing the equal incidence of cardiac infarction in laborers, professional persons, white collar workers and others of the general populations. They observed that in fewer than 2 per cent of cases of acute myocardial infarction was there unusual or severe muscular strain immediately preceding. On the other hand, Goodson[6] and Yater and co-workers[22] found that in the younger age group the terminal cardiac attack occurred during strenuous activity in as many as 32 per cent of cases and during mild and moderate activity in 52 per cent or more. In only 15 per cent did it occur at rest. These data are supported by statistics of French and Dock,[4] who found that in 100 cases of fatal coronary sclerosis in young soldiers, 35 of the patients died one to several hours after vigorous exercise. Seigler[21] observed that physical and emotional strain may be definite exciting factors in the pathogenesis of acute coronary changes and myocardial injury in the presence of coronary atherosclerosis. There are, then, many opinions and certainly controversial issues with regard to exertion or effort as a precipitating factor, which of course is the basis for the majority of workman compensation claims. It is probably generally accepted that continued coronary insufficiency over a period of thirty minutes or longer following exertion, resulting in myocardial infarction, is related to that exertion. However, as was brought out by Garnett,[5] there is no disease entity in medicine that demands a more careful and detailed history, with particular reference not only to the actual events immediately surrounding the onset of chest pain, but to a careful investigation of possible cardiac damage and symptoms prior to that time. When coronary occlusion and coronary insufficiency are differentiated, the latter is found to be a common condition and is frequently associated with a precipitating factor. However, coronary occlusion follows unusual exertion in only 2 per cent of cases generally, as shown by Master,[15] although the incidence of this relationship may be as high as 35 per cent in young persons, as shown by French and Dock.[4] In the light of the fact that a vast majority of patients in such cases in industry are over 45 years of age, the relationship of coronary occlusion to effort remains a very moot question, even to the point that the association of even so small a proportion as 2 per cent with exertion could be actually coincidental. The author is inclined to agree with Master that, considering the severe or moderate exercise the average person does in a period of 24 hours, if effort were a precipitating factor in coronary occlusion, the incidence of attacks during strain would be vastly greater. Careful questioning can elicit that premonitory symptoms were present in at least half of the patients; that in all probability the occlusion was already formed before the attack and that simple effort produced further coronary insufficiency, resulting in acute symptoms and the production of the myocardial infarction.

From a strictly industrial standpoint, there is no question of compensability in cases of contusion of the heart, whether it results in the very rare coronary occlusion or the usual direct myocardial hemorrhagic infarction. However, when an employee has an attack of chest pain while on the job, and the final diagnosis of coronary thrombosis is made, only a careful history can supply information for ascertaining whether the illness be rated as compensable. Inasmuch as in the State of California aggravation of a preexisting condition is grounds for assumption of liability by the insurance company or carrier,* it is even more imperative for a physician to establish the presence of preexisting coronary disease for the patient, or the absence of it for the insurance carrier. To further complicate this situation, the problem of determining the role of effort in the onset of an attack of coronary occlusion is masked by economic considerations, and, as Behneman[1] said, five prejudiced parties have a vital interest in the outcome of a cardiac accident after injury or stress—the patient, the employer, the trade union, the insurance carrier and the physician. Without reflecting upon the honesty of the vast majority of persons, the need for economic compensation may distort judgment, point of view and even memory; and it is rare that the consulting physician, the medical examiner for the insurance carrier, or an independent medical examiner for the Industrial Accident Commission is able to get the correct story, usually months after the occlusion has occurred. One has only to review cases heard by the Industrial Accident Commission to see the different stories told by the patient, first to his family doctor and later to the examiners for the insurance carriers and the Commission. It is widely accepted by the profession that an attack of acute coronary occlusion, or chest pain, which occurs at the time of or immediately following undue exertion should be classified as a compensable coronary occlusion (even though, as has been noted herein, the bulk of medical writings on this subject does not agree with this conclusion).

Accident Commission referees have informed the author that most of their difficulty in evaluating claims involving heart disease is due principally to the lack of either understanding or adequate presentation by the physician of a patient's claim. It is not

*Labor Code, Sec. 4663, states: "In case of aggravation of any disease existing prior to a compensable injury, compensation shall be allowed only for the proportion of the disability due to the aggravation of such prior disease which is reasonably attributed to the injury."

enough that the patient had an attack while at work. It must be shown that the attack was caused by the nature of his job or that a preexisting condition was aggravated by the job. Therefore the following approach to a classification of these lesions is suggested, with recognition, of course, that each case individually must be appraised on its own merits.

I. Clear-cut cases (compensable).

1. Direct cardiac injury. (a) Penetrating cardiac wounds. (b) Nonpenetrating cardiac contusion, direct and indirect.

2. Severe protracted physical exertion and activity greater than normally engaged in, over a period of time sufficiently long to produce infarction, with symptoms persisting for 30 minutes or longer following the cessation of the provoking factor (coronary insufficiency with infarction).

II. Questionable or controversial.

1. History of previous vascular disease with distress on exertion, followed by symptoms and findings of acute infarction, occurring on the job with usual or moderate activity. (Angina pectoris due to coronary insufficiency.)

2. Acute infarction immediately following severe effort; no previous history or symptoms; under the age of 45.

III. Nonindustrial.

1. History of previous periodic anginal distress or vascular disease with subsequent acute infarction occurring at work with routine duties.

2. History of no previous distress, acute signs and symptoms of myocardial infarction, in males over 45 years of age, with routine duties or moderate exertion of short duration.

The solution to the problem, of course, could be worked out by a committee appointed by the American Heart Association, the American Medical Association, the Industrial Medical Association and others interested in this phase of medical practice, to establish criteria for use by the courts, commissions and referees in cases of cardiac injury or disease allegedly arising out of or caused by the nature of the job. The author agrees with Garnett[5] and others that the enactment of adequate compensation laws to cover this specialized field of industrial liability in heart diseases and allied conditions is definitely needed and past due. Such laws are not without precedent; special legislation concerning occupational diseases as distinct from occupational injury has been enacted in some states. It has been suggested that a complete overhauling of the Industrial Accident Commission and of the California compensation laws in general is in order. There is considerable question as to whether the compensation laws of the State of California should be amended, as has already been done in New York State as noted by Master,[15] to provide that a worker shall receive compensation when he becomes ill while at work, regardless of previous illness. Incidentally, similar provisions have been made in portions of the California Labor Code, namely with firemen and policemen compensation.[3] Such changes in labor codes would do away with much controversy in this question of industrial coronary occlusion, coronary insufficiency and coronary contusion. But the changes would, of course, necessitate readjustment of insurance premiums, with greater expense to employers. It would also push us further toward the socialistic state, to which many of us do not subscribe.

2920 Fresno Street, Fresno.

REFERENCES

1. Behneman, H. M. F.: Coronary pathology and industrial liability, Med. Times, 79:553-559, Sept. 1951.

2. Boas, E. P.: Angina pectoris and cardiac infarction from trauma or unusual effort, J.A.M.A., 112:1887-1892, May 13, 1939.

3. Cal. Labor Code, Sec. 3212.

4. French, A. J., and Dock, W.: Fatal coronary arteriosclerosis in young soldiers, J.A.M.A., 124:1233, April 29, 1944.

5. Garnett, W. G.: Coronary artery disease in industry, Ind. Med. & Surg., 23:2, 59-63, Feb. 1954.

6. Goodson, W. H., Jr., and Willius, F. A.: Coronary thrombosis among persons less than forty years of age, Minn. Med., 22:291, May 1939.

7. Gutman, A. B.: Editorial, Am. J. Med., 14:1-3, Jan. 1953.

8. Editorial, Heart Injury, Brit. M. J., 1:670, May 12, 1945.

9. Kessane, R. W.: Traumatic heart disease, especially myocardial contusion, Postgrad. Med., 15:2, 114-119, Feb. 1954.

10. Leinoff, H. D.: Direct nonpenetrating injuries of the heart, Ann. Int. Med., 14:653-666, Oct. 1940.

11. Leinoff, H. D.: Acute coronary thrombosis in industry. I. Direct nonpenetrating injuries, with reports of cases, Arch. Int. Med., 70:33-52, July 1942.

12. Master, A. M.: The relation of effort to acute attacks of myocardial infarction, J.A.M.A., 129:90-91, Sept. 1, 1945.

13. Master, A. M.: Coronary artery thrombosis: the role of effort, trauma and other factors in its precipitation, Ind. Med., 6:307-309, May 1937.

14. Master, A. M., et al.: Factors and events associated with onset of coronary artery thrombosis, J.A.M.A., 109: 545-549, Aug. 21, 1937.

15. Master, A. M., et al.: Factors in the onset of coronary occlusion and coronary insufficiency, J.A.M.A., 148:10, 749-798, Mar. 8, 1952.

16. Master, A. M.: The relation of effort and trauma to acute coronary occlusion, Ind. Med., 9:359-364, July 1940.

17. McGill, R. J.: Cardiac contusion, Lancet, 1:997-998, May 17, 1952.

18. Moffatt, C. F.: Contusion of the heart, Can. M.A.J., 54:453-456, May 1946.

19. Race, G. A.: The role of trauma in acute coronary thrombosis, N. Y. St. J. Med., 45:2422-2423, Nov. 15, 1945.

20. Russeck, H. I., et al.: Indications for bishydroxycoumarin (Dicoumeral) in acute myocardial infarction, Circulation, 5:707-711, May 1952.

21. Seigler, R. H.: Cardiac disability and death caused by strain—problem in workman's compensation, J.A.M.A., 154:4, 294-299, Jan. 23, 1954.

22. Yater, W. M., et al.: Comparison of clinical and pathological aspects of coronary artery disease in men of various age groups, Ann. Int. Med., 34:352, Feb. 1951.

CASE REPORTS

- **Meningoencephalitis Due to Infectious Mononucleosis**
- **Limited Chronic Tension Pneumothorax with Lobar Atelectasis**
- **Cortisone in Treatment of Trichinosis**

Meningoencephalitis Due to Infectious Mononucleosis

RICHARD H. NATZKE, *M.D.*, San Francisco, and E. GALE WHITING, *M.D.*, Berkeley

IN THE PAST FEW YEARS the occurrence of central nervous system involvement in infectious mononucleosis has been noted in the literature with increased frequency.[1, 2, 4, 5] The estimated incidence of this complication is probably less than one per cent, but the mortality rate due to central nervous system involvement is apparently high. Lawrence[3] noted that neurological complications were the cause of death in seven of sixteen reported fatal cases of infectious mononucleosis. Any part of the central nervous system may be affected. The report herewith brings to five the number of reported cases of acute meningoencephalitis complicating infectious mononucleosis.

REPORT OF A CASE

The patient, a 24-year-old white man, was apparently well until May 7, 1954, when mild retro-orbital headache, malaise, anorexia, and a feeling of lightheadedness developed. The symptoms persisted but the patient was able to continue attending college classes. On May 12, 1954, he noted the onset of chilliness and excessive perspiration and on May 13 he was admitted to the hospital.

The general health of the patient had been excellent and, except for an injury of the neck incurred in a fall at the age of 18, he had had no serious illness.

At the time of admittance the temperature was 98.8° F., the pulse rate 90, respirations 20 per minute and the blood pressure 112/84 mm. of mercury. There were scattered acniform areas over the upper back. The vessels in the pharynx were slightly engorged and there were two small spots of white exudate on the right tonsil. Scattered lymph nodes about 0.5 cm. in diameter were palpated in both the cervical and the axillary areas. A prominent epitrochlear node was present on the right. The remainder of the examination was within normal limits.

On the first hospital day the temperature was 99.4° F. A feeling of light-headedness still was present and the patient vomited twice after the evening meal. Results of a neurological examination at this time were again normal.

On the second hospital day at 6:20 a.m. the patient suddenly had generalized clonic and tonic convulsions without incontinence, lasting some thirty seconds, following which he was semicomatose. Thirty minutes later generalized convulsion occurred again, characterized by violent athetoid motions of all extremities, wandering divergent eye movements and incontinence. This episode lasted some three hours. Sedation was parenterally administered and the patient gradually subsided into a comatose, restless state. There were no signs of meningeal irritation or paralysis. The reflexes were hyperactive but not of pathological order. The temperature rose to 104° F. (rectal). The patient remained comatose for approximately 48 hours. Moderate nuchal rigidity developed within ten hours after the convulsion and abdominal and cremasteric reflexes were absent; as extensor plantar responses were present on both sides.

On the fourth hospital day the temperature was 99.6° F. and the patient began to respond drowsily to simple questions. In the succeeding 24 hours he gradually became more alert, although still lethargic and slurring and slow of speech. From this point on, improvement was rapid. The abdominal and cremasteric reflexes returned and extensor plantar response had disappeared by the sixth hospital day. The generalized lymphadenopathic condition was more pronounced but the minimal spotty exudate in the pharynx had subsided. Nuchal stiffness persisted to some degree until the twelfth hospital day. At this time for a four-day period the patient noted polydipsia and polyuria, with an oral intake of 7,200 cc. of fluids on one day and output of 5,000 cc. of urine. The specific gravity of the urine during this transient phase was 1,001. These symptoms subsided spontaneously and the patient was discharged on the nineteenth hospital day without residual effect of the severe illness except for a generalized lymphadenopathic condition.

Results of blood, urine and spinal fluid studies are listed in Table 1. No bacterial growth was obtained on either blood or spinal fluid cultures. Results of skin tests with first strength purified protein derivative and 1:100 dilutions of coccidioidin were

From the Medical Service, Cowell Memorial Hospital, University of California, Berkeley 4.

TABLE 1.—*Laboratory data in case of meningoencephalitis*

	May 13	May 15	May 16	May 18	May 20	May 24	May 28
Blood							
Hemoglobin (gm. per 100 cc.)	13.8						13.6
Leukocytes (per cu. mm.)	6,900	15,400	11,000	11,000	12,200	11,000	7,200
Neutrophils per cent:							
Segmented	31	69	46	30	29	34	66
Non-segmented	7	10	16	6	9	14	8
Lymphocytes	62	12	35	64	60	45	25
Atypical (per cent)	70	50	90	70	50	80	30
Monocytes			3				
Eosinophils					2		
Heterophil titer (guinea pig absorption)	1:10			1:20	1:80	1:80	1:160
Sedimentation rate (mm. per hour Wintrobe)	7					16	7
Cerebrospinal fluid							
Appearance		clear		clear			
Pressure (mm. water)		110		135			
Cells							
Leukocytes (cu. mm.)		10		6			
Lymphocytic (per cent)		80		5			
Sugar (mg. per cent)		108		73			
Protein (mg. per cent)		175		90			
Gold curve		1112231100		0001110000			
Wassermann				Neg.			
Chlorides (mg. per cent)				638			
Heterophil antibody titer				1:10			

negative. Complement fixation studies on the serum for western equine encephalitis, St. Louis encephalitis and mumps were negative. Electrolyte studies of the serum during the phase of polyuria were within normal limits. No abnormalities were noted in liver function studies. Hemolytic staphylococcus aureus grew on cultures of material taken from the throat.

COMMENT

The cause of infectious mononucleosis is unknown, but the concept of a virus as the infecting agent is generally held by most authorities. The pronounced variability from case to case in symptomatology, physical findings and the duration of illness make this a most bizarre disease. If central nervous system symptoms are present, they may appear at the onset, although most commonly they do not occur until one to three weeks after onset.

In the case reported upon herein, the central nervous system manifestations appeared during the first week of his illness. The appearance of the pharyngeal exudate and the enlargement of lymph nodes were initially suggestive of the diagnosis. The confirmatory laboratory studies and the rising heterophil titer substantiated it. The spleen was never palpable.

The clinical picture produced by involvement of the nervous system may be indistinguishable from that caused by many other factors. Since the systemic signs of infectious mononucleosis may be minimal, it is important to realize the value of heterophil antibody tests in obscure cases of central nervous system symptomatology.

1555 Fifth Avenue, San Francisco 22 (Natzke).

REFERENCES

1. Bernstein, T. C., and Wolff, H. G.: Involvement of the nervous system in infectious mononucleosis, Ann. Int. Med., 33:1120, 1950.

2. Dolgopol, V. B., and Husson, G. S.: Infectious mononucleosis with neurologic complications, Arch. Int. Med., 83:179, 1949.

3. Lawrence, J. S.: Infectious Mononucleosis, in Cecil, R. L., and others, editors: A Textbook of Medicine, pp. 73-77, 8th ed., 1951.

4. Schumacher, E. E., Jr., et al: Infectious mononucleosis and Guillain-Barre syndrome, Arch. Int. Med., 93:246, 1954.

5. Slade, J.: Involvement of the central nervous system in infectious mononucleosis, N.E.J.M., 234:753, 1946.

Limited Chronic Tension Pneumothorax with Lobar Atelectasis

Two Cases Treated by Lobectomy and Decortication

JOHN S. CHAMBERS, JR., M.D., San Diego

CHRONIC PNEUMOTHORAX with positive pressure secondary to a pulmonopleural or bronchopleural fistula of valvular type occurs in many conditions[10] such as tuberculosis, pulmonary suppuration of other types, spontaneous rupture of emphysematous blebs and in empyemas in which the pus is coughed up and does not reform because of antibiotic therapy. Usually the involved lung is more or less uniformly collapsed but occasionally previous pleural symphysis limits the extent of pneumothorax so that collapse is localized to one or more lobes of a lung.

Two patients affected by limited tension pneumothorax with complete lobar collapse and suppuration were observed by the author within a month and both were treated by lobectomy and decortication.

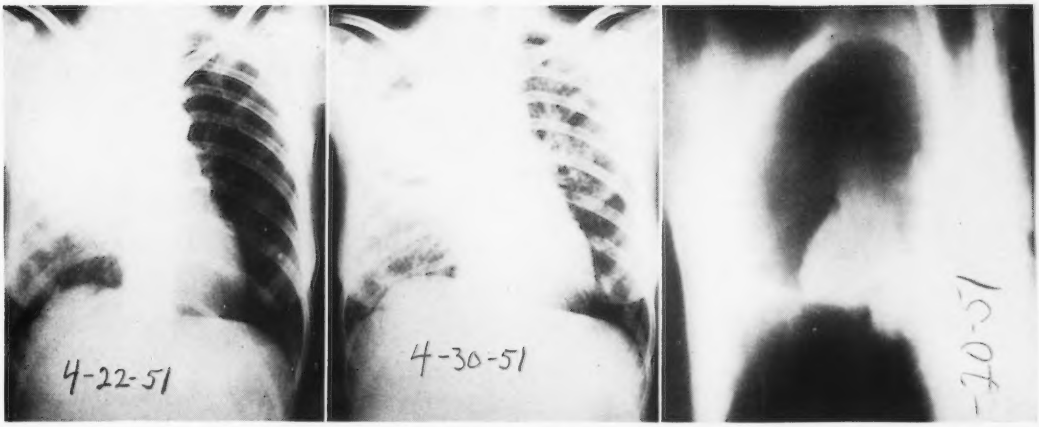


Figure 1.—(*Left*) A solid density with lack of aeration in the upper two-thirds of the right lung field. (*Center*) Partial clearing of the density in the right upper lung field with two fluid levels and partial collapse of the upper lobe. The left lung shows a transient diffuse infiltration. (*Right*) Planigram showing the collapsed airless right upper lobe with surrounding pneumothorax.

Reports of similar cases similarly treated were not noted in a summary review of the literature.

REPORTS OF TWO CASES

CASE 1. A 38-year-old housewife was admitted to San Diego County General Hospital April 22, 1951, with a history of onset of fever, general malaise and "flu-like" symptoms three weeks before. Two weeks before admittance she noted the onset of cough, productive of two tablespoonfuls of yellow-green sputum daily, and the cough persisted until admission. She also had mild diarrhea.

The patient appeared acutely ill and dehydrated when examined upon admittance. The temperature was 100.2° F. and the pulse rate 110 per minute. There were coarse rales, dullness and diminished breath sounds over the right upper quadrant of the chest posteriorly and anteriorly. The hemoglobin content was 6.6 gm. per 100 cc. of blood and leukocytes numbered 16,050 per cu. mm. An x-ray film of the chest (Figure 1) showed an airless density occupying the upper two-thirds of the right lung field. A Ghon's complex was present in the left lung field.

Penicillin was administered for three days, then aureomycin for a week, and then penicillin again until July 3, 1951. Four pints of blood was infused to correct anemia. The maximum daily temperature averaged 101° F. for the first week, 100.6° F. the second week, 99.6° F. the third week, and continued so for the next 12 weeks. The general condition of the patient improved gradually. The sputum decreased in amount but remained creamy in character. On May 4 thoracentesis was attempted at three different sites and only air was obtained. Thoracentesis was done again June 22 and again no fluid was withdrawn, but air was obtained and pressures were positive after removal of 200 cc. of air. Bronchoscopic examination was carried out and the tracheobronchial tree was normal except for redness

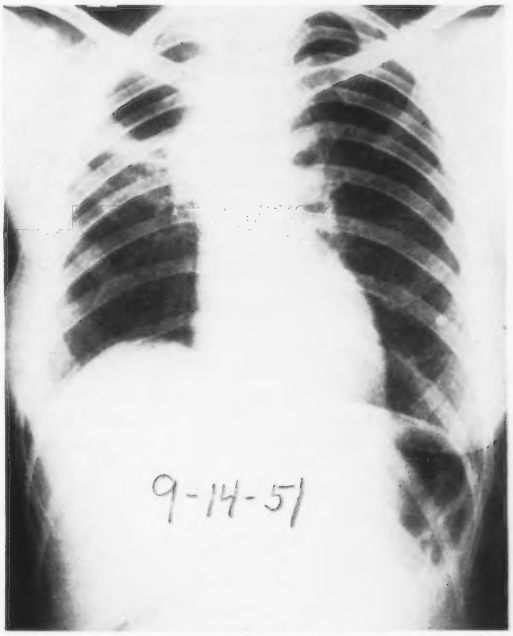


Figure 2.—Preoperative film showing progressive clearing of the infiltration, the pneumothorax no longer containing any fluid, and further shrinking of the upper pocket lobe.

and edema around the orifice of the right upper lobe. Purulent secretions were obtained from the bronchus serving this area and from the remainder of the right bronchial tree. X-ray films of the chest a week after admission (Figure 1) showed two air pockets with fluid levels and partial collapse of the upper part of the right lung associated with diffuse bilateral soft infiltration. Later films (Figures 1 and 2) showed progressive collapse of the upper part of the

right lung, with pneumothorax becoming more prominent, and disappearance of the fluid and clearing of the soft infiltration (Figure 1).

Concentrates and cultures of specimens of sputum taken April 23, May 1, May 23 and June 19 were negative for acid fast bacilli. A specimen obtained May 14 was negative on concentrate and positive on culture for acid-fast bacilli. Because of the positive culture the patient was transferred to the tuberculosis division of the hospital on July 3. There five consecutive daily sputum specimens were examined for acid-fast bacilli by concentrate and culture with negative results. On July 9 administration of dihydrostreptomycin, 1 gm. twice weekly, and para-amino-salicylic acid, 12 gm. daily, was started. By this time the patient was afebrile and practically asymptomatic except for expectoration of a small amount of purulent sputum.

On September 27 operation was done with the patient in the face down position, under pentothal-nitrous oxide-ether anesthesia. The right side of the chest was opened through the fifth intercostal space. The parietal pleural peel was freed from the chest wall by sharp and blunt dissection. The middle and lower lobes were normal but the pleural space over them was obliterated. The pneumothorax space was opened and the upper lobe was found to be completely collapsed, with small reddish elevated areas of what appeared to be granulation tissue on its surface. The upper lobe was then resected with the parietal peel, the bronchus being closed with 4-0 silk and the vessels individually ligated with 2-0 silk. Two intercostal tubes were inserted and the incision closed in layers with interrupted silk.

Postoperatively the patient did well, the temperature becoming normal on the third postoperative day from a high of 101.6° F. on the second day. On the first postoperative day, because of x-ray evidence of possible middle lobe atelectasis, bronchoscopic examination was carried out but atelectasis was not present. Streptomycin and para-amino-salicylic acid were continued for two months postoperatively, and the patient was discharged on November 13, 1951. A film of the chest was made June 6, 1952 (Figure 3) and at that time the patient said that she was feeling fine and had had no recurrence of symptoms.

The pathologist described the upper lobe specimen as a "shrunken irregular nubbin which showed dilated thick walled bronchi and peribronchial fibrosis." There was no gross nor microscopic evidence of tuberculosis, and there was no growth of acid-fast bacilli on cultures of material from the pleura and the upper lobe.

The diagnosis was: (1) Chronic fibrous pleuritis; (2) bronchiectasis and pulmonary fibrosis.

COMMENT ON CASE 1

In this patient there was right pleural effusion limited to the upper lung field. The effusion produced upper lobar collapse and probably became infected, although there is no definite proof that the fever, leukocytosis and signs of inflammation were from empyema rather than from pulmonary suppuration. Treatment with antibiotics apparently controlled the infection but a fistula developed between the pleural space and the lung or bronchus, as serial films showed progressive increase of air and decrease of fluid in the pleural cavity with concomitant collapse of the upper lobe.

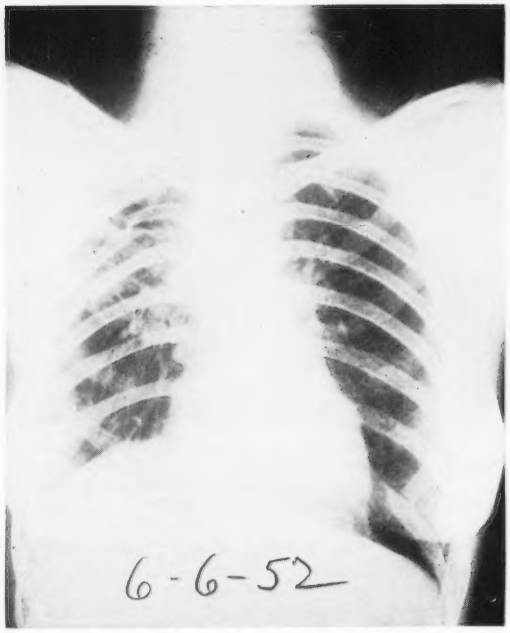


Figure 3.—After decortication and right upper lobectomy. Note good expansion of the remaining lobes.

In light of all the evidence it seems the isolated culture showing acid-fast bacilli was probably a laboratory error, unless (improbably) there was originally a tuberculous effusion secondary to parenchymal tuberculosis in either the middle or lower lobe.

CASE 2. A 45-year-old woman was admitted to Balboa Hospital Sept. 6, 1951, with chills, fever, cough productive of up to a cupful of yellow sputum daily for a week and loss of 20 pounds in body weight and general malaise.

Fifteen months previously the patient had had a similar attack accompanied by pain in the right side of the chest for several weeks. She had been treated elsewhere with penicillin.

Upon examination the patient seemed acutely ill and a "wet" cough was noted. The temperature was 101.2° F. Shotty, freely moveable nodes were palpated in the cervical and axillary regions. There were diminished to absent breath sounds and tactile fremitus over the lower part of the chest on the right side both anteriorly and posteriorly. The motion of the chest wall was normal.

An x-ray film of the chest (Figure 4) showed an area of increased radiolucency at the right base with absence of lung markings and depression of the right diaphragm. There was also a sharply demar-

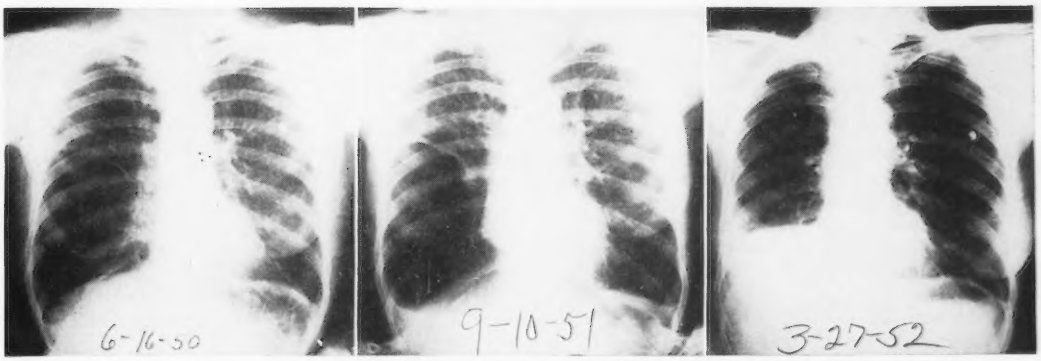


Figure 4.—(*Left*) Pneumothorax limited to the right lower lung field. (*Center*) More extensive pneumothorax with some atelectatic lung tissue along the right border of the heart. (*Right*) Film taken six months after decortication and right lower and middle lobectomy. Note good expansion of the remaining upper lobe.

cated mass at the right border of the heart which was thought to be collapsed lung tissue. The left lung field showed a Ghon's complex.

Penicillin was administered and the temperature became normal on the third hospital day. The sputum became clear and was greatly reduced in amount. Bronchoscopic examination was carried out on September 10. There was reddened, edematous mucosa throughout the right lower bronchial tree, and purulent secretions were aspirated from the middle and lower lobe bronchi. The secretions were negative for fungi and acid-fast bacilli on smear and concentrate, and no malignant cells were observed on cell block examination.

A previous photofluorogram dated January 6, 1950, showed the chest normal except for the Ghon's complex on the left, and an x-ray film of the chest dated June 16, 1950, showed pneumothorax limited to the right lower quadrant without evidence of tension or atelectasis (Figure 4).

On September 12, 1951, the patient was transferred to Mercy Hospital and eight days later right thoracotomy was performed with the patient in the face down position under endotracheal pentothal-nitrous oxide-ether anesthesia. The pleural cavity was not entered until most of the pleural peel over the lower chest wall and diaphragm had been decorticated. The pleural space was obliterated except in the lower half of the chest where pneumothorax was present. Both the middle and the lower lobes were observed to be completely airless. As the visceral peel was dissected away, the lower lobe remained atelectatic and shrunken but the middle lobe expanded normally. The upper lobe was normal to palpation, the middle lobe contained areas of crepitation and fibrosis, and the lower lobe was collapsed and fibrotic. The middle and lower lobes were consequently resected, the bronchial stump being closed with interrupted 4-0 silk sutures. The diaphragm, which had been inadvertently stripped from its chest wall attachment for a distance of 3 inches, was resutured to the chest wall and two intercostal drainage tubes were inserted. The chest was closed with silk.

Postoperatively bloody discharge and air drained from the intercostal tubes for four days, necessitating transfusion and the application of suction to the intercostal catheters. The catheters were removed on the fifth postoperative day and the patient was discharged on the eighth postoperative day. She gained strength and returned to normal activities in about three weeks. Except for repeated "chest colds" she remained asymptomatic thereafter.

On examination by the pathologist both lower and middle lobes showed purulent exudate and dilatation of the bronchi. The lower lobe was airless and the middle lobe aerated only partially.

The diagnosis was: (1) Chronic fibrous pleuritis; (2) chronic interstitial pneumonitis with bronchiectasis of the middle and lower lobes.

COMMENT ON CASE 2

In this patient the disease probably started with spontaneous pneumothorax secondary to a ruptured bleb. At that stage, aspiration, intercostal tube drainage or temporary phrenic paralysis might have resulted in expansion of the middle and lower lobes and prevented the onset of suppuration in them.

DISCUSSION

Various methods have been advocated in the treatment of chronic pneumothorax: (a) The use of irritants[5] to aid in attaining pleural symphysis (silver nitrate,[3] iodized talc,[9] etc.); (b) thoracoscopy[8] with lysis of adhesions, cauterization of blebs, or poudrage; (c) phrenic nerve interruption[4]; (d) closed (intercostal) catheter drainage[2] and (e) thoracotomy[1, 2, 6, 7, 10, 11, 12] with excision of blebs, closure of fistulae, resection of diseased lung and decortication of the thickened peel (extrapleural lobectomy).

It is felt that in the two patients presented here anything short of thoracotomy, decortication and resection would have failed to obliterate the space and relieve the symptoms. The main indication for operation in both patients was pulmonary suppura-

tion rather than obliteration of the pneumothorax.

It is believed that total decortication of the pneumothorax pocket was advantageous from the technical as well as the therapeutic point of view.

In the first case it was debated whether to perform thoracoplasty with the intent of obliterating the space. In view of the operative finding of thick peel over the chest wall and upper mediastinum it is doubtful that it would have been successful.

In the second case a combination of closed intercostal drainage, phrenic nerve interruption and pneumoperitoneum was contemplated but considered contraindicated in view of the obvious pulmonary suppuration in the lower and middle lobes, because the chance of thus effecting relief of the attacks of fever, cough and expectoration seemed remote. Likewise the threat of empyema developing seemed great.

SUMMARY

The case histories of two patients with limited or localized chronic tension pneumothorax are presented. The cause of the pneumothorax in one case was probably suppurative pneumonitis with localized effusion and in the other probably rupture of an emphysematous bleb. In both patients total lobar collapse and suppuration were present and both were treated by complete decortication and resection of the involved lobes.

1205 Medico-Dental Building, 233 A Street, San Diego 1.

REFERENCES

1. Brewer, III, L. A., Dolley, F. S., and Evans, B. H.: The surgical management of chronic "spontaneous" pneumothorax, J. Thor. Surg., 19:167, 1950.

2. Briggs, J. N., Walter, R. W., and Byron, F. X.: Spontaneous pneumothorax, Dis. of Chest, 24:564, 1953.

3. Brock, R. C.: Recurrent and chronic spontaneous pneumothorax, Thorax, 3:88, June 1948.

4. Goldschmidt, W.: Phrenicusausschaltung beim pathologischen Pneumothorax, Wein. klin. Wchnschr., 44:1276, 1931.

5. Hennell, H., and Steinberg, M. F.: Tense pneumothorax: Treatment of chronic and recurrent forms by induction of chemical pleuritis, Arch. Int. Med., 63:648, 1939.

6. Horsley, J. S., and Bigger, I. A.: Lung Decortication and Pneumothorax, p. 685, Operative Surgery, C. V. Mosby Co., 5th ed., 1940.

7. Hoyer, L. P., and Claggett, O. T.: Treatment of chronic spontaneous pneumothorax by lobectomy, J. Thor. Surg., 15:418, 1946.

8. Kipfer, R.: Kasuistischer Beitrag zur Pathogenese des Spontanpneumothorax und zu seiner Therapie mit Hilfe der Thorakoskopie und endopleuralen Kaustik, Verhandl. d. deutsch. Gesellsch. f. inn. Med. Kong., 44:193, 1932.

9. Medici, F. A.: Resultados de la pleurodesis por el metodo de Bethune en el neumotorax espontaneo benigno, An. Cated. de pat. y clin. tuberc., 6:106, 1944.

10. Movitt, E. R., Smith, J. V., and Eloesser, L.: Treatment of spontaneous pneumothorax, Dis. of Chest, 13:221, 1947.

11. Sarot, I. A.: Extrapleural pneumonectomy and pleurectomy in pulmonary tuberculosis, Thorax, 4:173, 1949.

12. Tyson, M. D., and Crandall, W. B.: The surgical treatment of recurrent ideopathic spontaneous pneumothorax, J. Thor. Surg., 10:566, 1941.

Cortisone in Treatment of Trichinosis

JOSEPH F. SADUSK, JR., M.D., Oakland

WHILE TRICHINOSIS is generally regarded as a benign disease, it is well known that the clinical course may at times be quite severe; and indeed mortality rates of from approximately 3 to 6 per cent have been recorded.[3, 6, 9]

Until very recently, the only recognized therapeutic procedure was that of bed rest and supportive medication. Scattered reports on the use of corticotropin (ACTH)[4] and cortisone[7, 8] indicate that these agents may be of considerable value in the treatment of trichinosis.

The purpose of this communication is to report the treatment of a case of trichinosis with cortisone, to show that this agent was most effective in the amelioration of symptoms, and to attempt to define the appropriate dosage of the drug.

REPORT OF A CASE

A 31-year-old traveling salesman was admitted to the hospital on the thirteenth day of illness with complaints of fever, chills, muscle aching and pain, sweats, severe frontal headache and swelling of the eyelids.

The illness began November 27, 1952, with a sudden severe chill and temperature rise to approximately 101° F. The patient then perspired profusely throughout the night. The next day he felt well and was essentially asymptomatic until December 2, at which time he noticed puffiness of the lower eyelids which rapidly spread in a day or so to the upper lids and finally involved the entire periorbital area. On December 5, the patient suddenly had another chill. The temperature rose rapidly, and there was muscle aching of a generalized nature but with particular severity in the anterior thigh muscles. On December 6 another severe shaking chill occurred and chills and aching of the muscles continued but the periorbital edema began subsiding slowly. Rather severe frontal headache developed. Temperatures ranged between 100.2° and 102.4° F. when he was admitted to hospital. There was no history of skin eruption or diarrhea.

The only infectious disease noted in the patient's history was measles. The patient, traveling by automobile throughout the rural districts of California, frequently ate inadequately cooked "hamburgers," possibly containing pork, at roadside stands.

Upon physical examination the patient was observed to be well developed and well nourished. He appeared acutely ill and prostrated. The temperature was 102.0°, the pulse rate 96, and the blood pressure 120/40 mm. of mercury. The skin was flushed, sweating and hot. No skin eruption was noted. There was a moderate tenderness of the anterior muscles of the thigh. The conjunctivae were clear. Moderate bilateral periorbital edema was

From the Medical Service, the Samuel H. Merritt Hospital, Oakland 9.

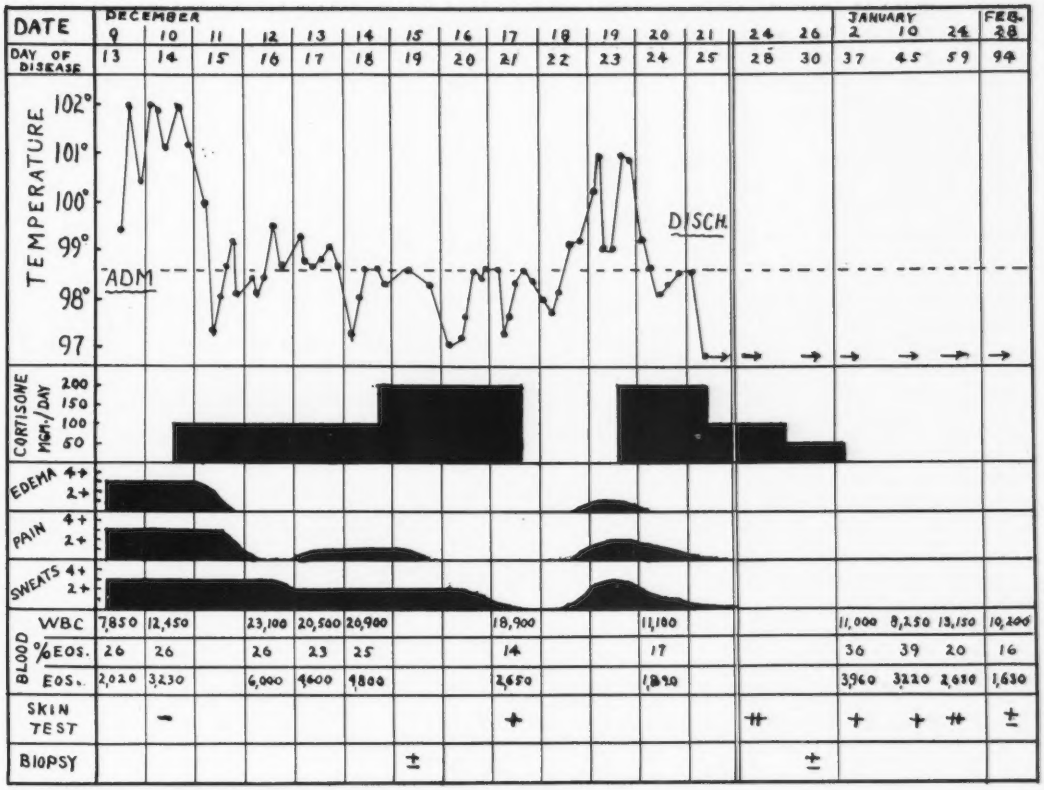


Chart 1.—Effect of cortisone in case of trichinosis.

noted. Pulsation was regular and bilaterally equal. The heart was not enlarged and there were no murmurs. The lungs were clear. The abdomen was soft and nontender and neither liver nor spleen was palpable. Deep reflexes were normal and equal, and there were no clinical signs of meningeal irritation.

Data on the subsequent course are shown in Chart 1. On admission, the following laboratory data were obtained. Erythrocytes numbered 4,470,000 per cu. mm. of blood and the hemoglobin content was 15.4 gm. per 100 cc. Leukocytes numbered 7,850 per cu. mm.—4 per cent nonsegmented neutrophils, 45 per cent segmented neutrophils, 20 per cent lymphocytes, 5 per cent monocytes and 26 per cent eosinophils. The urine was clear, with acid reaction, and the specific gravity was 1.020. It was negative for sugar and albumin. Centrifuge sediment showed only occasional granular casts. A culture of blood was sterile. Brucella agglutination was negative in a dilution of 1:20. The Widal reaction was as follows: B. typhosus 1:40 (H antigen) and negative (0 antigen), B. paratyphosus A negative, and B. paratyphosus B 1:40.

The Weil-Felix reaction (Proteus OX19) was negative in a titer of 1:20. Skin tests with a 1:10,000 dilution of trichinella extract (Lederle) did not cause a wheal with either the control or the antigen.

After 24 hours during which fever and severe symptoms and signs of muscle pain, sweats and periorbital edema continued, cortisone therapy was started with a dosage of 25 mg. by mouth every 6 hours for a total of 100 mg. per day. Within 12 hours, the temperature began to fall rapidly and by the end of 24 hours the periorbital edema, prostration and muscle pain had disappeared, although night sweats continued in diminishing degree for another six days. When low grade fever began on the second day of therapy and continued for another 24 hours, cortisone was increased to 200 mg. per day in a dosage of 50 mg. every six hours. The temperature promptly dropped to normal limits and the patient continued quite asymptomatic.

On December 15, the nineteenth day of disease, specimens of tissue were removed* from the anterior thigh muscles for study. On routine examination of about 35 sections of the material† no encysted parasites were seen but there was a focal inflammatory reaction between the muscle fibers representing myositis and associated angiitis. There were no vascular changes suggestive of periarteritis. The entire block was sectioned and every tenth section was reviewed but still no Trichina were found.

* By Dr. Walter L. Byers of Oakland.

† By Drs. Charles Baker, Ruth Seale, and Bruno Gerstl of Oakland.

Finally, sections lying in approximation with sections of areas showing myositis were also studied and a fragment of a Trichina was discovered (Figure 1).

A skin test with trichinella antigen on the twenty-first day of disease revealed a faintly positive reaction with a blanched wheal 3 x 4 mm., without surrounding erythema, and the control was entirely negative. The eosinophil content of the blood slowly decreased as shown in Chart 1.

Cortisone was abruptly discontinued on December 17 (the twenty-first day of disease) in order to determine what therapeutic role this drug might have played. Within 24 hours, the temperature rose, reaching 101.0° F., and symptoms and signs of muscle pain, sweats and periorbital edema reappeared. Administration of cortisone was resumed in a dosage of 200 mg. per day. The response was again dramatic, with fall of temperature to normal and abatement of signs and symptoms. There was a further drop in the total eosinophil content to 1,890 cells per cu. mm.

The patient was finally discharged on December 21 (twenty-fifth day of disease) after 13 days of hospitalization. Convalescence was continued at home with a dosage of 100 mg. of cortisone per day (25 mg. every six hours). This dosage was continued until the twenty-ninth day of disease, following which a dosage of 50 mg. daily (25 mg. every 12 hours) was continued until the thirty-seventh day of disease.

A trichinella skin test using the same solution of antigen as before was repeated on the twenty-eighth day of disease and there was a moderately positive reaction, the wheal measuring 8 x 9 mm. with a small surrounding area of erythema. Biopsy from the deltoid muscle was repeated on the thirtieth day of disease, but again, while there was definite evidence of a myositis similar to that previously described for the first biopsy, no parasites were found in the muscle tissues on routine examination.

Data on the patient as an outpatient are shown in Chart 1. It will be seen that reaction to skin tests ranged between mild and moderate and that the eosinophil count rose to a value of 3,960 cells per cu. mm. when cortisone was discontinued, but subsequently fell so by the ninety-fourth day of disease the eosinophil count had fallen to 1,630.

It is perhaps pertinent to note that on the second hospital day an electrocardiogram revealed no abnormalities except for an unusually high degree of elevation of the ST segment in the Wilson unipolar precordial lead V-2 only. This was considered to be a borderline tracing. Electrocardiograms repeated seven days later and then after a two-week interval were normal, with no evidence of the ST segment elevation.

The patient was seen for the last time on July 6, 1953. The trichinella skin test reaction was quite negative. Leukocytes numbered 7,100 per cu. mm., with 6 per cent eosinophils, and the sedimentation rate was well within normal limits. The patient was in excellent health, as he had been for the preceding three months.

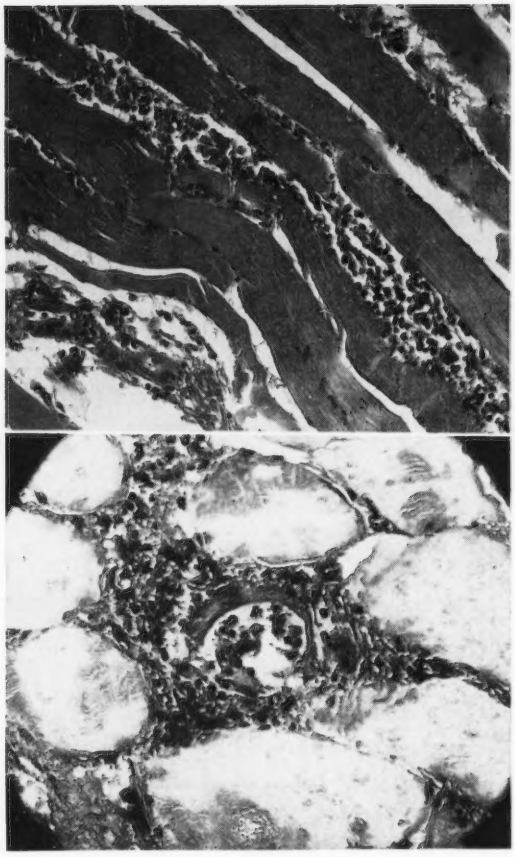


Figure 1.—Sections of anterior thigh muscle showing fragments of a trichina (upper) and associated myositis (lower).

COMMENT

There is no doubt that cortisone had a beneficial effect upon symptoms during the acute stage of the disease. The drop in temperature, relief from prostration, disappearance of periorbital edema and muscle pain, and development of a feeling of well-being were most dramatic and essentially in accord with the few previous reports in the literature. That these changes were due to cortisone is evidenced by the reappearance of symptoms when the medication was abruptly stopped on the twenty-first day of disease and eventual clearing again with resumption of medication.

It would appear that a dose of 100 mg. of cortisone per day was ineffective since the patient continued to have low grade fever, muscle pain and sweats when that amount was given. When the dosage was increased to 200 mg. per day, however, these symp-

toms rapidly cleared. Treatment should doubtless be prolonged, probably for a period of from two to three weeks, although this point is not yet sufficiently clarified. In the three case reports previously noted,[4, 7, 8] the use of corticotropin (ACTH) or cortisone was continued for from five to 18 days. It is likely that the duration of treatment depends upon the stage in which the disease is treated, with a longer period of therapy required for cases treated early in the disease.

The mechanism of action of corticotropin or cortisone in trichinosis—as well as in other diseases of bacterial or unknown origin—is not clear but probably depends upon an altered response between host and the infecting agent. In trichinosis, corticotropin and cortisone would appear to control the severity of disease until the larvae have become encysted and the host produces immune antibodies, thus rendering the disease clinically inactive.

It is clear from the studies of Luongo and coworkers[4] that corticotropin had no specific effect upon trichinella larvae in experimentally infected guinea pigs. On the other hand, those investigators found a definite reduction in the toxic effects of the disease in animals treated with corticotropin together with a temporarily diminished eosinophilia and a significantly longer survival period. Treated animals that died did so only after corticotropin was discontinued, which points up the necessity for a long term period of treatment.

Two additional points warrant further discussion, namely, the difficulty of securing confirmation of the disease by positive biopsy and the role that repeated injections of trichinella antigen may play in producing positive skin tests.

It is obvious that the intensive study leading to the discovery of a Trichina in the first biopsy material in the present study is not practical and consequently one must ordinarily be content with the finding of myositis. This point has already received mention in the literature.[1]

Whether or not repeated skin testing on several occasions with antigen will produce enough sensitivity to cause a positive skin reaction remains a controversial point. The experience of McCoy and co-workers[5] with repeated tests on control individuals indicates that the probability of sensitization is small; on the other hand, Baron and Brunner[2] showed that 56 per cent of test subjects had a positive reaction to skin test by the ninth test dose of Trichina antigen, and 33 per cent had sensitivity after three to six injections. Since it is unusual to persist in skin testing with trichinella antigen past two to three attempts, the importance of sensitization is rather minimal.

SUMMARY

Cortisone was efficacious in the treatment of a case of trichinosis insofar as the relief of signs and symptoms was concerned.

In the early and clinically active stage of the disease, apparently a dosage of 200 mg. daily of cortisone is required, with treatment continuing until the fourth or fifth week of disease in a diminishing dose down to 50 mg. per day.

459 Thirtieth Street, Oakland 9.

REFERENCES

1. Augustine, D. L.: Trichinosis—incidence and diagnostic tests, N.E.J.M., 216:463, March 18, 1937.

2. Baron, B., and Brunner, M.: Active sensitization in human beings with trichina antigen, J. Allergy, 13:459, July 1942.

3. Gould, S. E.: Trichinosis. Charles C. Thomas, Springfield, Ill., 1945, p. 279.

4. Luongo, M. A., Reid, D. H., and Weiss, W. W.: The effect of ACTH in trichinosis—a clinical and therapeutic study, N.E.J.M., 245:757, Nov. 15, 1951.

5. McCoy, O. R., Miller, J. J., Jr., and Friedlander, M.: J. Immunol., 24:1, Jan. 1933.

6. Ober, R. E.: Trichinosis—a review of cases in Massachusetts from 1936 to 1945, N.E.J.M., 235:839, Dec. 12, 1946.

7. Rosen, E.: Cortisone treatment of trichinosis, Am. J. Med. Sci., 223:16, Jan. 1952.

8. Rothenberg, F.: Treatment of trichinosis with cortisone, J. Med. Soc. N. J., 48:517, Nov. 1951.

9. Trichinosis (Editorial), J.A.M.A., 152:241, May 16, 1953.

California MEDICINE

DWIGHT L. WILBUR, M.D. . . . . Editor
ROBERT F. EDWARDS . . . Assistant to the Editor
Editorial Executive Committee:
ALBERT J. SCHOLL, M.D. . . . . Los Angeles
H. J. TEMPLETON, M.D. . . . . Oakland
EDGAR WAYBURN, M.D. . . . . San Francisco

For information on preparation of manuscript, see advertising page 2

EDITORIAL

Antibiotics, Skill and Judgment

"Of late, without the least pretence to skill,
Ward's grown a famed physician by a pill."

WHILE BROWSING THROUGH some old books one evening not long ago we came upon the above satirical lines from Alexander Pope. Pope's life had been a continuous round of suffering with asthma, and, having failed to find relief in treatment by the accepted physicians of his day, he succumbed to the entreaties of friends and finally employed the notorious quack, "Spot" Ward, to prescribe for him. Ward, whose success as a quack had brought him a fortune, employed a "universal remedy"—a highly dangerous compound of antimony; but in Pope's case he was entirely unsuccessful save for inspiring the thought-provoking lines quoted above.

There are many today who employ the antibiotics as a "universal remedy" much as Spot Ward used antimony in 1744, and when health is restored the beneficence of Nature is misinterpreted as the physician's skill. This injudicious use of antibiotics not only breaks faith with our professional heritage but endangers the well-being of our patients and the educational attitudes of our developing physicians.

From the outset the dramatic nature of the antibiotic drugs led to unwarranted enthusiasm for their use. This attitude was not properly dissipated by the inevitable disappointment in any panacea, for each time a stable evaluation of a given antibiotic was about to be reached a newer drug of broader antimicrobial activity was optimistically heralded. The search for new antibiotics still goes on but each discovery makes it more difficult to find a new one that has any advantages over those already in use. The consequences and harmful effects from the indiscriminate use of antibiotics are becoming increasingly apparent as the populace of our nation receives in one form or another approximately 360 tons of penicillin, 250 tons of streptomycin and 300 tons of tetracyclines and chloramphenicol yearly, not to mention erythromycin, neomycin and others. It has been estimated that at present less than 5 per cent of all antimicrobial drugs is administered on proper clinical indications. The rest is wasted on minor respiratory infections which are generally viral in origin and not susceptible to the administered antibiotic, on inconsequential infections on surface areas of the body, in illusory attempts at prophylaxis of bacterial infections, and in unnecessary combinations of drugs.

Jawetz[1] and Rantz[2] have classified the harmful results of the indiscriminate use of antibiotics into the following broad categories: (1) hypersensitivity and direct toxicity, (2) development of resistance of bacteria to antibiotics, and (3) the emergence of serious infections by organisms which were unknown previously or (4) "superinfection," presumably resulting from antibiotic-induced alterations in the normal body flora.

Hypersensitivity and direct toxic reactions can occur with any antibiotic agent. These reactions occur after either topical or systemic administration. Fortunately, most side effects are transient and subside when the offending agent is discontinued. Oftentimes this hypersensitive state has been produced by the unnecessary administration of antibiotics for an insignificant ailment, such as a cut, bruise, cold, abrasion, or minor surgical procedure; and subsequently the person who receives it for so little reason may have his welfare endangered because he cannot be given indicated antibiotic therapy at a time of serious need. Physicians must constantly guard against this misuse of invaluable agents.

Initially over 90 per cent of all strains of staphylococci were sensitive to even small doses of penicillin. At present, 50 to 90 per cent of pathogenic staphylococci, particularly those in and around hospital air

and dust, are resistant to penicillin. These same organisms have also rapidly become resistant to the tetracyclines and erythromycin. New antimicrobial agents are constantly being sought since mortality from staphylococcal sepsis has again risen inordinately as a result of unyielding bacterial resistance consequent to the unwarranted use of antimicrobial agents.

The emergence of serious infections by unknown organisms and the associated problem of "superinfection" are particularly noteworthy in the urinary, pulmonary and intestinal tracts. So common has this clinical entity become that it must always be suspected when the patient does not respond to antimicrobial therapy in the predicted fashion. The control of these secondary or superinfections oftentimes requires the closest cooperation between the clinician and the laboratory in defining the offending organism and finding a way to control it. Control of these difficult infections has led to further hazards in antibiotic therapy, for physicians are tempted to use multiple antibiotic agents in such circumstances. It has been demonstrated that one antibiotic agent may actually diminish the effectiveness of another agent, and complex problems of bacterial antagonism and synergism result from injudicious use of antibiotic agents.

The time has come when physicians must take cognizance again of the laws of Nature in the control of infection and the development of immunity, and search out the true values of their skill, knowledge and judgment. The understanding of these laws will safeguard better the welfare of their patients than the indiscriminate use of the "antibiotic pill" or injection.

REFERENCES

1. Jawetz, E.: American Review of Medicine, Section on Infectious Diseases, 1954.

2. Rantz, L. A.: Consequences of the widespread use of antibiotics, Calif. Med., 81:1, July 1, 1954.

Editorial Comment . . .

Problems of Research on Smog

TO SPEAK OF THE PROBLEMS and difficulties in medical research on smog seems to denote a rather negativistic approach. However, considering the nature of some of the comments in the press and some of the programs on radio and television, it appears that a recapitulation of the difficulties and problems and a wholesome balancing of our approach to the problem is quite in order. Much of the material in the press and on radio and television would lead us to believe that the whole problem can be simply solved by abolishing all the sources of smog. This is undoubtedly true but the improbability of accomplishment is great. The press, radio and television convey to the public only the information given them by the groups interested in smog abatement, both from the research angle and the administrative angle.

Due to the lack of coordinated effort and the lack of interchange of information, it appears as though each group would be entirely satisfied if only its specific problems were solved. As an example, if the substance in the atmosphere causing damage to the leafy vegetable crops could be removed, the agricultural group would apparently be satisfied. The same would be true of each group having a specific complaint, such as that the beautiful landscape is obscured, or that smog causes smarting of the eyes.

This seeming incoordination is undoubtedly due to the lack of communication and understanding between all groups. We in medicine have been remiss in not communicating with the other groups until recently. We must now bring before the public and the other groups the fact that smog presents many possible insidious effects on the health of the human being. Since we can point to no specific cases of death due to smog, nor to any new diseases caused by smog, nor to any terrifying physical defects caused by smog, it is extremely difficult to arouse enough interest in the public in general, in other groups interested in smog abatement, in our legislators and many times in our own medical profession to support any research in the field of medical effects of smog. To stimulate interest is one of the major problems, since the expense of research of the kind needed is comparatively great and full interest and support of all groups is of utmost importance. The great majority of the public outside of the medical profession will have to be informed and educated as to the need for medical research on the smog problem. Everyone agrees that research in the field of water pollution was, and still is, quite necessary and that it has paid off in stopping water-borne epidemics, in halting the poisoning of fish and game, and in many other ways. If it is possible to show the

public that research on air pollution can be as beneficial, or more beneficial, then a major hurdle will have been topped.

The difficulties encountered in the actual technical research portion of this problem are varied and numerous. The greatest difficulty is psychological in nature in that the research is rather dull and uninteresting because it takes considerable time and the results are not dramatic. The inhalation studies to determine maximal permissible concentration are expensive and tedious and at best take from 12 to 30 months for each pollutant studied. Unfortunately there are not many who will undertake research of this type.

Smog is a mixture of possibly hundreds of pollutants, some of them in the original state in which they were dumped into the atmosphere and others as new compounds formed as the result of chemical reactions occurring due to the presence of sunlight, ozone, oxides of nitrogen and other factors in the atmosphere. With this wide spectrum of pollutants, it becomes quite a problem to select the compounds most likely to cause deleterious effects on human health. After a compound has been selected for study, the problem of preparing it in a pure state arises; and as a further difficulty to plague the researcher, there are, for many of the compounds, no accurate methods of analysis of the minute quantities contained in air and animal tissue.

Another major difficulty experienced by persons interested in smog research is the appalling lack of what might well be classed as clinical material and clinical information. A somewhat generalized clinical relationship of human health to smog concentration might be obtained by cooperation of the practicing physician. A daily report of case loads of specific types, such as asthma and upper respiratory tract infections, could be correlated with the concentration of smog, as determined by the Air Pollution Control District. If the practicing physicians who report are objective and unbiased by personal feelings on the smog problem, it is logical to assume that statistical analysis of the reports, correlated with the smog analysis, would give some indication as to whether or not clinical information might be expected from a study of this kind.

Chemists, engineers, meteorologists and physicists have made great strides in determining many of the sources of smog, as well as in identifying many of its constituents. Much more work is necessary in these scientific fields, however, before a successful conclusion can be reached. Research has been started in the biological and medical fields in a number of places but, considering the magnitude of the problem, it is fair to say that in the field of medicine the surface has barely been scratched. Before the smog problem can truly be said to be conquered, biologists and medical men must supply information concerning the maximal permissible concentration of many or all of the constituents of smog. It is only from information of this kind that teeth can be fashioned for the laws regulating air pollution. The necessary research in this field can be begun and prosecuted only if full support and interest, both moral and financial, are given by everyone—most of all the researchers' colleagues in the field of medicine.

FRED A. BRYAN, M.D.
Department of Medicine
School of Medicine
University of California
Los Angeles 24.

LETTERS to the Editor . . .

September 27, 1954

YOUR RECENT EDITORIAL [September 1954] on multiphasic surveys is good, but does not get to one of the roots of the evil. This is the manner in which our profession is exploited by the persons conducting the survey. For example, in the Los Angeles survey to which you refer, the fee paid to physicians for interpreting the chest x-rays was 5 cents per film.

We train a physician in medicine for eight years, then send him through internship and often a three-year residency. After twelve such years of training he attempts to go into practice. He finds various agencies and groups conducting mass surveys, and the fee which he is accorded for rendering a diagnostic conclusion as to the presence or absence of significant shadows in a chest film is 5 cents! It matters not that the film is small; it still takes time, medical judgment and ability to determine the presence or absence of significant shadows.

We do not know what fee is accorded the physicians who read the electrocardiograms; perhaps they get 10 cents per electrocardiogram. And what is paid the physician supervising the vision, blood serum or hemoglobin tests?

In what other field of human endeavor are such small fees accorded to professional persons? This is all very well for the group, but distinctly unreasonable for the physician.

Finally, the advocates of preventive medicine would have mass cytology surveys for cancer of the cervix; mass surveys of the stomach for carcinoma; mass surveys for diabetes and for other noncommunicable diseases. As you stated, the actual yield in cases detected by such surveys is extremely small; the number of patients who take the necessary steps to correct the condition (if actually confirmed) is notoriously low.

Meantime, physicians are asked to contribute their services to these programs either gratis or at a wage totally inadequate for the labor performed. The result is indifferent survey work and no true gain in public health.

Yours sincerely,

M. MASTERSON, M.D.

* * *

IN THE AUGUST ISSUE of CALIFORNIA MEDICINE, final paragraph, first column, page 105, the statement is made that in Riverside County the C.P.S. income ceiling was eliminated, as was done in San Pedro.

This statement is not quite correct: the income ceiling for C.P.S. in Riverside County is still $4,200. The $6,000 ceiling has been discussed and is now under consideration, but no change has been made.

Mention of this is made only to make sure our position here is clearly and accurately presented.

Sincerely yours,

ROBERT MARVIN
Business Secretary
Riverside County Medical Association

* * *

THE EDITORIAL, Volume 81, No. 3, page 240, September 1954, on Multiphasic Surveys: Streamlined Diagnosis for the Public, is one of the best summaries of this so-called Public Health endeavor.

Because of the fair and complete evaluation of this technique or program, we are interested in obtaining additional copies to be used for teaching purposes....

Sincerely,

L. S. GOERKE, M.D.
Department of Public Health and Preventive Medicine
School of Medicine
University of California
Los Angeles 24

California MEDICAL ASSOCIATION

NOTICES & REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 408th Meeting of the Council of the California Medical Association, San Francisco, October 3, 1954.

The meeting was called to order by President Morrison, in the absence of Council Chairman Lum and Vice-Chairman Heron, in Room 210 of the St. Francis Hotel, San Francisco, at 9:30 a.m., Sunday, October 3, 1954.

Roll Call:

Present were President Morrison, President-Elect Shipman, Vice-Speaker Bailey, Secretary Daniels, Editor Wilbur and Councilors West, Wheeler, Sampson, Pearman, Ray, Sherman, Bostick, Teall, Frees, Carey, Kirchner, Reynolds and Varden. Absent for cause, Speaker Charnock, Councilors Lum, Loos, Randel and Heron.

A quorum present and acting.

Present by invitation during all or part of the meeting, Messrs. Hunton, Thomas, Gillette and Clancy of C.M.A. staff, Howard Hassard, legal counsel; Ben H. Read and Eugene Salisbury of the Public Health League of California; county society executive secretaries Pettis of Los Angeles, Foster of Sacramento, Nute of San Diego, Thompson of San Joaquin, Wood of San Mateo and Donovan of Santa Clara; Mr. K. L. Hamman of California Physicians' Service; Mr. Rollen Waterson, health insurance consultant; Dr. Malcolm Merrill, State Director of Public Health; Dr. D. H. Murray, legislative chairman; Drs. Lewis T. Bullock, Paul Hoaglund and Robert L. Smith, Jr., of the California Society of Internal Medicine, and Drs. J. Norman O'Neill, Herbert L. Joseph, J. W. Green, Burt Davis, Hunter Brown, A. E. Larsen, Edwin L. Bruck, Dan O. Kilroy and Francis J. Cox.

1. *Minutes for Approval:*

(a) On motion duly made and seconded, minutes of the 406th meeting of the Council held in Los Angeles May 8-12, 1954, were approved.

(b) On motion duly made and seconded, minutes of the 407th meeting of the Council held in Los Angeles May 12, 1954, were approved.

(c) On motion duly made and seconded, minutes of the 344th meeting of the Executive Committee, held in San Francisco July 10, 1954, were approved.

2. *Membership:*

(a) A report of membership as of October 1, 1954, was received and ordered filed.

(b) On motion duly made and seconded, 103 delinquent members whose dues had been paid were voted reinstatement.

(c) On motion duly made and seconded in each instance, 15 applicants were voted Retired Membership. These were: Wm. Whitfield Crane, Alameda-Contra Costa County; Jacob Abowitz, Burrell O. Raulston, Los Angeles County; Marie Boehm, Napa County; Bert W. Hardy, R. J. van Wagenen, Orange County; Herbert S. Anderton, George W. Getze, Merrel H. Taylor, San Diego County; Elbridge J. Best, Robert Lorentz, Mary Jones Mentzer, Emily Woelz, San Francisco County; and Edith E. Johnson and Clyde Wayland, Santa Clara County.

(d) On motion duly made and seconded in each instance, 51 applicants were voted Associate Mem-

bership. These were: W. E. Allen, H. S. Colony, D. K. Dudderar, Irving Fien, P. L. Livingston, James V. Roche, Erich Spiro, Anton A. Tratar, Alameda-Contra Costa County; Philip G. Beal, Merl J. Carson, Emanuel Cohen, W. E. Compere, Jr., Charles L. Corley, William A. Craig, Mary B. Dale, J. E. Englehardt, John R. Evans, Wm. G. Figueroa, Arthur F. Gardner, Hyman W. Gierson, Mildred Healey, James Irvine, George Kalmansohn, Herbert Lamont, Nicholas M. Langer, Melvin H. Levin, Louis Lunsky, Isidore Matilsky, Thomas Miller, Lewis B. Newman, Irving Nissenbaum, Robert B. Parker, A. H. Parmelee, Jr., Harry W. Perrin, A. F. Rasmussen, Jr., Marvin M. Schroeter, Jullien L. Smith, Robert S. Stone, Grace I. Walla, Byron M. Walls, Warner R. Wright, Angela R. Young, Los Angeles County; Len H. Andrus, Monterey County; Ralph F. Waddell, Riverside County; Bertram E. Marks, San Diego County; Margaret Carlsmith, Lillian Cottrell, Raymond E. Ponath, San Francisco County; H. D. Chope, San Mateo County; Lydia Verbarg, Santa Clara County; and Thomas L. Gore, Ventura County.

(e) On motion duly made and seconded, 33 applicants were voted a reduction of dues because of illness or postgraduate study.

3. *Financial:*

A report of bank balances as of October 1, 1954, was received and ordered filed.

4. *Legal Department:*

Howard Hassard, legal counsel, discussed the California State Supreme Court decision in litigation in which the Association has been interested, together with possible applications of this decision by others than the original parties in the case.

On motion duly made and seconded, three statements from San Diego for legal and court costs in this case, totaling $4,844.61, were approved for payment.

5. *Medical Services Commission:*

(a) Dr. Hollis Carey, chairman of the Medical Services Commission, reported that the Commission had asked its fee schedule subcommittee to develop a fee schedule for use by California Physicians' Service to cover contracts written under a $6,000 income ceiling. This schedule was approved by the Executive Committee of the Commission and by the Executive Committee of the Association and has been turned over to C.P.S. for use in the event it is needed.

(b) The Commission has selected Santa Clara and Riverside counties as pilots for a study to determine the aggregate cost of training physicians, an economic study approved by the House of Delegates. On motion duly made and seconded, an appropriation of $4,000 was approved for this purpose.

(c) The Commission has worked out three proposed fee schedules for California Physicians' Service. These are (1) a schedule for new contracts to be written under the $4,200 income ceiling; (2) a schedule for contracts written under a $6,000 income ceiling; and (3) a schedule to apply to members whose income falls between $4,200 and $6,000. These are considered temporary schedules pending completion of the relative value fee study. The new schedules have removed some of the inequities which have been criticized by specialists in internal medicine.

On motion duly made and seconded, and with an amendment requested by the internists through Dr. Lewis T. Bullock, it was voted to approve the proposed $4,200 fee schedule and transmit it to the Board of Trustees of C.P.S.

(d) On motion duly made and seconded, it was voted to appropriate $15,000 for the cost of the relative value fee study.

(e) Mr. Waterson, at the request of Dr. Carey, reported on the failure of insurance representatives to sell contracts in East Contra Costa and Alameda counties on the basis of indemnities identified with usual fee tables. He also discussed the differences between fee schedules based on C.P.S. membership with incomes between $0 and $6,000 and a dual schedule to cover those up to a $4,200 ceiling and those between $4,200 and $6,000.

After considerable discussion, it was moved, seconded and voted to recommend to the Trustees of California Physicians' Service that dual income ceilings of $4,200 and $6,000 be established, with due structures and fee schedules in consonance.

It was regularly moved, seconded and voted that the proposed fee schedule of the Medical Services Commission, to cover those between the $4,200 and the $6,000 income ceilings be approved for presentation to the C.P.S. Board of Trustees, with the understanding that this schedule was for interim use and was subject to modifications which the C.P.S. Trustees might make.

6. *Committee on Scientific Work:*

(a) Dr. Albert C. Daniels, chairman of the Committee on Scientific Work, asked authority to schedule the 1955 Annual Session on the days of May 1 to 4, inclusive, and to hold scientific meetings during the sessions of the House of Delegates. On motion duly made and seconded, this authority was granted.

(b) The committee recommended that the transportation expenses of the wives of invited guest speakers be met by the Association. On motion duly made and seconded, this expense was approved.

7. *California Medicine:*

(a) On motion duly made and seconded, it was voted to appoint Dr. Eugene S. Hopp to the Committee on Advertising, to succeed Dr. Robert C. Martin, resigned.

(b) On motion duly made and seconded, it was voted to appoint Dr. John D. Camp, Los Angeles, to the Editorial Board, Section on Radiology, to succeed Dr. John Crossan, resigned.

(c) On motion duly made and seconded, it was voted that advertising offered for publication should be adjudged on its own merits, regardless of the ownership of the producing company.

(d) On motion duly made and seconded, it was voted to permit the use of all or part of the mailing list by the Committee for Postgraduate Medical Education of the Alameda-Contra Costa Medical Association.

8. *Subsidized Medical Practice:*

Drs. J. Norman O'Neill and Hunter Brown discussed a series of items bearing on the subsidization of medical practice in state-owned institutions, together with other programs undertaken in the same areas. On motion duly made and seconded, it was voted to refer this material to the Executive Committee, which is to have power to take appropriate action.

9. *California Physicians' Service:*

Mr. K. L. Hamman reported that the beneficiary membership of California Physicians' Service was 649,025 as of last August 31, an increase of about 11 per cent in the past year. He also gave a report on the current activities of C.P.S.

10. *Public Policy and Legislation:*

(a) Dr. Dwight H. Murray, legislative chairman, reported on a meeting with representatives of the State Department of Mental Hygiene, who suggested the establishment of clinics jointly financed by state and local funds, in areas of 50,000 or more population, for screening mental hygiene cases. The committee does not believe this type of legislation should be supported.

(b) Dr. Murray also reported on a proposed bill by the State Department of Public Health for the control of rabies, a measure which the committee wishes to support as a public health move.

(c) Dr. Murray asked that a letter be sent to the county society secretaries, urging them to bring to the Association any suggestions for proposed legislation, rather than working at the county level. It was agreed that this be done.

(d) Mr. Ben H. Read, executive secretary of the Public Health League of California, introduced his new associate, Mr. Eugene Salisbury, and urged a complete vote at the November 2 elections.

(e) Mr. Hassard discussed the current situation relative to physical therapy, in which field two legislative enactments have become effective and have created some confusion.

11. *Rural Health:*

A communication from the A.M.A. Council on Rural Health, relative to medical care for indigents, was received and ordered referred to the Medical Services Commission for consideration.

12. *Physicians' Benevolence Committee:*

Discussion was held on the possibility of converting the Physicians' Benevolence Committee into a nonprofit corporation which could qualify legally as a charitable fund exempt from the requirement of collecting entertainment taxes on benefit performances by auxiliary chapters or others. On motion duly made and seconded, Mr. Hassard was authorized to proceed in this direction.

13. *Audio-Digest Foundation:*

A report from Dr. Edward C. Rosenow, Jr., Editor of Audio-Digest Foundation, was presented and ordered filed.

14. *Public Relations:*

Mr. Ed Clancy reported on the current activities of the public relations department and pointed out that more than 2,300,000 pieces of literature have been distributed to physicians to give to their patients.

Mr. Clancy also suggested the formation of a special committee to investigate the use of narcotics, especially by minors. On motion duly made and seconded, it was voted to refer this matter to the Executive Committee.

15. *Blood Bank Commission:*

Mr. Hunton reported on the plans of the Fresno County Medical Society for establishment of a blood bank to become part of the C.M.A. system. The Executive Committee had previously approved a loan of $50,000 to the county society for this purpose.

16. *State Department of Mental Hygiene:*

It was agreed to cooperate with the California State Department of Mental Hygiene in a review and study of the problems of alcoholism.

17. *Medical Education:*

Report was made that the $100,000 appropriated to the American Medical Education Foundation had been forwarded and that the deans of several dozen medical schools had written their profound thanks for their share of this contribution.

18. *Medical Assistants:*

A request from an organization of medical assistants for the naming of several Association members as advisory committee members was received. It was agreed to suggest that the standing Committee on Associated Societies and Technical Groups be named in this capacity.

19. *General Practitioner of the Year:*

A proposal was received to nominate Dr. H. Bernard Graeser of Holtville for consideration by the A.M.A. as the General Practitioner of the Year. On motion duly made and seconded, it was voted to make this nomination.

20. *Conference of Physicians and Schools:*

On motion duly made and seconded, it was voted to appropriate $2,500 to cover the cost of the Conference of Physicians and Schools to be held in Fresno November 12 and 13, 1954.

21. *Time and Place of Next Meeting:*

It was agreed to leave the time and place of the next Council meeting in the hands of the Executive Committee.

Adjournment:

There being no further business, the meeting was adjourned at 5:30 p.m.

A. A. MORRISON, *President*
Acting Chairman
ALBERT C. DANIELS, *Secretary*

Krebiozen Again

A statement by the Cancer Commission of the California Medical Association

CANCER "CURES," like poison ivy, have a way of recurring. The "Krebiozen Research Foundation of Chicago" has recently recircularized the profession with:

"A Report on Krebiozen—An Agent for the Treatment of Cancer."

The Cancer Commission of the California Medical Association has received several inquiries concerning this report, especially since the name of Dr. Andrew Ivy is prominently displayed therein. The Cancer Commission is unable to report, on the basis of the available facts, any objective evidence of benefit in cancer with this so-called drug.

The following reports have appeared in the recent past:

1. "A Status Report on Krebiozen," Council on Pharmacy and Chemistry, American Medical Association, J.A.M.A., 147:864, October 27, 1951.

2. Opinion of the Committee on Cancer Diagnosis and Therapy of the National Research Council, M. D. Winternitz, M.D., Chairman, Division of Medical Sciences, J.A.M.A., 147:1297, November 24, 1951.

3. Schmitz, H. E., and Smith, C. J.: Primary treatment of cervical carcinoma with "Krebiozen," J.A.M.A., 148:843, March 8, 1952.

4. Szukewski, H. A.: Krebiozen in treatment of cancer, J.A.M.A., 148:929, March 15, 1952.

5. Loefer, J. B.: Ineffectiveness of "Krebiozen" therapy on transplanted mouse leukemia and lymphosarcoma, J.A.M.A., 149:298, May 17, 1952.

The essence of these reports is that this drug "obtained from horse serum" was used on a large number of patients with cancer by a number of responsible clinicians with wide experience in cancer therapy. Examination of the surgical and autopsy specimens of treated patients revealed no significant changes in cell structure or tumor architecture. There was no significant evidence of objective regression of cancer. There is no scientific evidence that Krebiozen has a beneficial effect in human cancer.

In Memoriam

AUSTIN, FLORENCE O. Died in Ukiah, September 20, 1954, aged 61. Graduate of Rush Medical College, Chicago, Illinois, 1919. Licensed in California in 1920. Doctor Austin was a member of the Los Angeles County Medical Association.

✠

BREUER, ROLAND G. Died in San Jose, June 22, 1954, aged 59, of lobar pneumonia. Graduate of the University of Nebraska College of Medicine, Omaha, Nebraska, 1919. Licensed in California in 1927. Doctor Breuer was a member of the Santa Clara County Medical Society.

✠

DOANE, FRANK L. Died in Crescent City, September 2, 1954, aged 81, of coronary thrombosis. Graduate of the Cooper Medical College, San Francisco, 1903. Licensed in California in 1903. Doctor Doane was a member of the Tehama County Medical Society, a life member of the California Medical Association, and an associate member of the American Medical Association.

✠

MCKELLAR, JAMES H. Died in Pasadena, September 9, 1954, aged 71, of coronary artery disease. Graduate of the University of Southern California School of Medicine, Los Angeles, 1905. Licensed in California in 1905. Doctor McKellar was a member of the Los Angeles County Medical Association.

✠

MCKENNEY, JAMES A. Died in Yosemite, October 3, 1954, aged 76, of coronary artery disease. Graduate of St. Louis University School of Medicine, Missouri, 1914. Licensed in California in 1914. Doctor McKenney was a member of the Alameda-Contra Costa Medical Association.

✠

RIJHOFF, VICTOR E. Died in San Francisco, September 20, 1954, aged 50, of carcinoma of the stomach. Graduate of St. Louis University School of Medicine, Missouri, 1933. Licensed in California in 1934. Doctor Rijhoff was a member of the San Francisco Medical Society.

✠

RUTH, ROY F. Died in Woodlake, September 11, 1954, aged 61, of pulmonary embolism. Graduate of the College of Physicians and Surgeons, Los Angeles, 1917. Licensed in California in 1917. Doctor Ruth was a member of the Tulare County Medical Society.

Annual Meeting

SAN FRANCISCO

May 1-4, 1955

Papers for Presentation

If you have a paper that you would like to have considered for presentation, it should be submitted *to the appropriate section secretary* (see list on this page) not later than November 20, 1954.

Scientific Exhibits

Space is available for scientific exhibits. If you would like to present an exhibit, please write immediately to the office of the California Medical Association, 450 Sutter Street, San Francisco 8, for application forms. To be given consideration by the Committee on Scientific Work, the forms, completely filled out, must be in the office of the California Medical Association not later than December 1, 1954. (No exhibit shown in 1954, and no individual who had an exhibit at the 1954 session, will be eligible until 1956.)

Medical Motion Pictures

Applications are now being received for the program of the Medical Motion Pictures Section. Please submit your application to Arthur E. Smith, M.D., Chairman, Medical Motion Pictures Section, 1930 Wilshire Boulevard, Los Angeles 57, California.

SCIENTIFIC PAPERS
SCIENTIFIC EXHIBITS
MEDICAL MOTION PICTURES
PLANNING MAKES PERFECT
AN EARLY START HELPS

SECRETARIES OF SCIENTIFIC SECTIONS

ALLERGY . . . . . **Ben C. Eisenberg**
2680 Saturn Avenue, Huntington Park

ANESTHESIOLOGY . . . . . **John P. Howard**
2558 4th Avenue, San Diego 3

DERMATOLOGY AND SYPHILOLOGY . **R. Raymond Allington**
3115 Webster Street, Oakland 9

EYE, EAR, NOSE AND THROAT—

ENT . . . . . **Francis A. Sooy (Chairman)**
490 Post Street, San Francisco 2

EYE . . . . . **Robert N. Shaffer**
490 Post Street, San Francisco 2

GENERAL MEDICINE . . . . . **Roger O. Egeberg**
Wadsworth General Hospital, Los Angeles

GENERAL PRACTICE . . . . **Stanley R. Parkinson**
326 G Street, Marysville

GENERAL SURGERY . . . . **Lyman A. Brewer, III**
2010 Wilshire Boulevard, Los Angeles 57

INDUSTRIAL MEDICINE AND SURGERY . . **Homer S. Elmquist (Asst. Secretary)**
629 S. Westlake, Los Angeles 57

OBSTETRICS AND GYNECOLOGY . . . **George Judd**
2010 Wilshire Boulevard, Los Angeles 57

PATHOLOGY AND BACTERIOLOGY . . **Orlyn B. Pratt**
312 North Boyle Avenue, Los Angeles 33

PEDIATRICS . . . . . **Milo B. Brooks**
1015 Gayley Avenue, Los Angeles 24

PSYCHIATRY AND NEUROLOGY . . . **Knox H. Finley**
450 Sutter Street, San Francisco 8

PUBLIC HEALTH . . . . . **E. M. Bingham**
130 South American, Stockton

RADIOLOGY . . . . . **Merrell A. Sisson**
450 Sutter Street, San Francisco 8

UROLOGY . . . . . **Wilson Stegeman**
1166 Montgomery Drive, Santa Rosa

WOMAN'S AUXILIARY
TO THE CALIFORNIA MEDICAL ASSOCIATION

LEADERSHIP IN COMMUNITY HEALTH

Leadership in Community Health is the theme chosen by our national president, Mrs. George Turner of El Paso, Texas. In speaking of the responsibility of every physician's wife to her own home community, Mrs. Turner says: "The achievements of American medicine are unparalleled and our pride in them is justifiable. However, we must realize that the appreciation of the public is not based on excellent medical care alone, but is in ratio to our devotion to the welfare of the community through Health Education and Community Health Service. It is in this unobtrusive, daily relationship between the doctor and his patients, and the doctor's wife and her contacts, that confidence in our sincerity and ability as leaders in community health is established."

Individually and as Auxiliary members, our doctors' wives in California are giving of their time, money and talents to such organizations as the American Cancer Society, the Red Cross, Community Blood Banks, the Heart Association, Crippled Children's Society and other voluntary health agencies.

* * *

SAN BERNARDINO HAS REVOLVING LOAN FUND

One of the major projects of the Auxiliary in San Bernardino County is the revolving loan fund established to help student nurses. By next year, there will be six trainees using this fund, the money for which is earned by the gala Holiday Ball in November of each year.

During the five years of its existence, the San Bernardino Auxiliary has doubled in size and has won a reputation for active participation in community health activities. The president this year is Mrs. Gordon W. Hodges.

* * *

PLACER-SIERRA-NEVADA AUXILIARY AIDS CANCER FUND

Only four years old, the Placer-Sierra-Nevada Auxiliary has chalked up a fine record of achievements in worthwhile community work. High on its list of major projects is the Cancer Fund Drive, to which the members give generously of their time and money. Another big project of this energetic group is Nurse Recruitment and the Student Nurses' Fund. Mrs. David Kindopp assumed the presidency in June, replacing Mrs. Saul Ruby, who moved to San Jose.

* * *

GENEROUS CONTRIBUTIONS FROM HUMBOLDT COUNTY

The Auxiliary in our northernmost organized county, Humboldt, has been unusually successful in fund-raising projects. Last year, its annual Christmas Ball netted $940, enabling the Auxiliary to expand its program of nursing scholarships. The members hope that the girls who take training will return to Humboldt County when they graduate to help relieve the acute shortage of trained nurses.

Another successful spring benefit, a card party every April, raises a generous donation to the American Cancer Society. President of the Humboldt Auxiliary this year is Mrs. Garvin Goble of Fortuna. Another of the members, Mrs. Theodore Poska, is state chairman of Public Relations.

* * *

FALL CONFERENCE WELL ATTENDED

A record attendance of 107 at the annual Fall Conference of state officers and chairmen and county presidents and presidents-elect at the Highlands Inn near Carmel during the last week of September is an indication of the steady growth of the Woman's Auxiliary in numbers and in enthusiasm. The agenda was long, and filled with panel discussions, reports and group participation.

A very valuable contribution to the conference was the discussion by Mr. Robert Huber of the firm of Peart, Baraty and Hassard, legal counsel for the California Medical Association, who told the Auxiliary members about admission taxes on their fund-raising benefits, and how to determine which beneficiaries are tax-exempt.

Another guest speaker was Mrs. Earl Shoesmith, of the State Office of Civil Defense. Our honored guest at the conference was our national president, Mrs. George Turner of El Paso, who outlined the aims and objectives of the Auxiliary for the year, stressing "Leadership in Community Health" as the theme.

MRS. FREDERICK J. MILLER, *President*

NEWS & NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

The one hundred twenty-first meeting of the **American Association for Advancement of Science** will be held December 26 to 31, 1954, on the campus of the University of California in Berkeley.

LOS ANGELES

The City of Los Angeles Department of Public Health is **seeking qualified physicians** to fill seven positions now vacant, Dr. George M. Uhl, city health officer, announced recently. The positions are: director of district health services, salary $10,104 to $12,576 a year; a director and an assistant director of the tuberculosis division and a director of communicable disease control, at salaries of from $8,124 to $10,102; a central laboratory assistant director at $6,900 to $8,680; and a virologist, the salary to be based on the background and experience of the applicant.

Candidates from any part of the United States may communicate with Dr. Uhl at 111 East First Street, Los Angeles.

SAN FRANCISCO

The program for a meeting of the **Northern California Rheumatism Association** to be held Friday, December 3, at 8:00 p.m. in Toland Hall, University of California Medical Center, San Francisco, follows:

An Improved Uric Acid Determination with Uricase—Thomas Feichtmeir, M.D., and Harold Wrenn, Ph.B.

Ratio of Reduced to Total Glutathione in Rheumatic Diseases—William C. Kuzell, M.D., Peter Koets, Ph.D., Guy Pierre Gaudin, M.D., R. W. Schaffarzick, M.D., and W. Edward Naugler, M.D.

Protective Effect of Diethylenediamine (Piperazine) against Phenylbutazone Toxicity in Mice, Guy Pierre Gaudin, M.D., B. Brown, M.D., E. A. Mankle, M.D., and William C. Kuzell, M.D.

Metabolic Effects of Fluorohydrocortisone Compared with Hydrocortisone—R. H. Orr, M.D., V. Di Raimondo, M.D., and Peter H. Forsham, M.D.

Excretion of Corticoids in Patients with Collagen Disease—George Michaels, Ph.D., Estuko Osawa, A.B., and Laurance W. Kinsell, M.D.

Metabolic Observations in Patients Receiving Long Term Therapy with Cortisone—E. W. Fredell, M.D., Harold Johnson, M.D., Marcus A. Krupp, M.D., and Ephraim P. Engleman, M.D.

Bone Resorption in a Case of Psoriasis and Arthritis—Roland Davison, M.D.

The Sequelae of Rheumatic Fever in Men—Leo Hollister, M.D., Felix Kolb, M.D., and Ephraim P. Engleman, M.D.

Fellowships in hematology will be available for appointment July 1, 1955, at Stanford University Hospital and the Veterans Administration Hospital, San Francisco. The fellowships carry a stipend and are subject to renewal for the following year. The San Mateo County Heart Association is assisting in establishing a **fellowship in cardiology** at the Veterans Hospital. This fellowship also carries a stipend and is subject to renewal.

* * *

Dr. Karl F. Meyer, director emeritus of the Hooper Foundation at the University of California Medical Center, San Francisco, has received the Borden Award in the Medical Sciences for 1954.

The high award for scientific research consists of $1,000 for scientific research and a gold medal. Awards are given in several fields. Dr. Meyer was cited for his pioneering research in plague, psittacosis, and other epidemic diseases.

SAN MATEO

Dr. Frances Baker of San Mateo was elected secretary of the American Congress of Physical Medicine and Rehabilitation at the annual meeting held in Washington, D. C., in September.

SANTA CLARA

Dr. G. M. Byington of San Jose, formerly a U.S. Public Health Service Surgeon, recently became public health physician in the Palo Alto office of the Santa Clara County Department of Public Health.

TULARE

Dr. Elmo Zumwalt, medical director of Tulare County Hospital, recently was appointed acting county health officer to take the place vacated by the resignation of Dr. Donald Williams. Dr. Williams, who had taken over the post last spring, resigned to resume the study of medicine at Harvard.

GENERAL

The Sixth American Congress on Obstetrics and Gynecology will be held in the Palmer House, Chicago, December 13-17, under the auspices of The American Committee on Maternal Welfare, Inc., and The American Academy of Obstetrics and Gynecology.

The program, designed for physicians, nurses, public health officials and hospital administrators concerned with mother and baby care, will include approximately 30 formal papers, 22 symposia and panels, luncheon discussion groups and round-table discussions. Scientific and technical exhibits will present the latest developments in the field.

* * *

The eighth annual meeting of the **Western Society for Clinical Research** will be held January 28 and 29, 1955, at Carmel, California.

Information regarding the meeting may be obtained from Dr. Herbert N. Hultgren, secretary, at Stanford Hospital, San Francisco 15.

* * *

The American Goiter Association has again offered the **Van Meter Prize Award** of $300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the Association which will

be held in Oklahoma City, Okla., April 28, 29 and 30, 1955, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English, and a typewritten double spaced copy in duplicate sent to the Secretary, John C. McClintock, M.D., 149½ Washington Avenue, Albany, New York, not later than January 15, 1955.

POSTGRADUATE EDUCATION NOTICES

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Fall schedule:

Dermatology in General Practice—November 10 to December 15, 1954.

In Long Beach:

Office Gynecology—January 6, 13, 20, 1954.

Contact: Mrs. Margaret H. Griffith, Assistant Head of Postgraduate Instruction, Medical Extension, University of California, Los Angeles 24, California.

Children's Hospital Seminars, Hematology, October 23, 1954; Orthopedic Problems of Infancy and Childhood, December 4, 1954; The Management of Metabolic Disturbances Commonly Encountered in Practice, January 22, 1955; The Allergic Dilemma, February 26, 1955; Infections and Their Management, March 26, 1955. Accreditation by the Board of General Practice has been granted. Gertrude F. Jones, M.D., Chairman, Medical Alumni Committee, Children's Hospital, 3700 California Street, San Francisco 18.

CALIFORNIA MEDICAL ASSOCIATION, POSTGRADUATE ACTIVITIES

A Circuit Course of Postgraduate Lectures will be given in the Sacramento Valley cities of Dunsmuir, Chico, Marysville, and Auburn, during the fall months of 1954. Lecturers are from the faculty of Stanford University Medical School. The weeks of November 15 to 19, Antibiotics, Dr. Lowell A. Rantz; December 6 to 9, Practical Problems in Clinical Endocrinology, Dr. Francis Greenspan.

CALIFORNIA MEDICAL ASSOCIATION, POSTGRADUATE ACTIVITIES INSTITUTES

Southern Counties—Arrowhead Springs—January 27-28, 1955.

North Coast Counties—Santa Rosa—February 3-4, 1955.

West Coast Counties—Santa Barbara—February 17-18, 1955.

San Joaquin Valley Counties—Yosemite—April 21-22, 1955.

Sacramento Valley Counties—Cal-Neva—June 16-17, 1955.

A Circuit Course of Postgraduate Lectures will be given during the fall months of 1954 in the North Coast County cities of Eureka, Ukiah, Woodland and Napa. Lecturers are from the faculty of the University of California School of Medicine. The weeks of November 15 to 18, Neurosurgical Problems as the Result of Accident; December 6 to 9, Practical Diagnosis and Treatment of Cardiac Arrhythmias, Norman J. Sweet.

Contact: C. A. Broaddus, M.D., Director of Postgraduate Activities, P.O. Box AI, Carmel, California.

Medical Dates Bulletin

This bulletin of the dates of postgraduate education assemblies and the meetings of various medical organizations in California is supplied by the Committee on Postgraduate Activities of the California Medical Association. In order that they may be listed here, please send communications relating to your future medical or surgical programs to: C. A. Broaddus, M.D., P.O. Box AI, Carmel, California.

JANUARY

American College of Surgeons, Palm Springs, January 21-22, 1955.

California Medical Association, Annual Session, San Francisco, May 1-5, 1955.

American Medical Association
Clinical Session, 1954, Miami, November 30-December 3.
Annual Session, 1955, Atlantic City, June 6-10.
Clinical Session, 1955, Boston, November 29-December 2.

* * *

Research Study Club of Los Angeles—24th Annual Mid-Winter Clinical Convention in Ophthalmology and Otolaryngology, January 17-28, 1955. Mr. H. M. Nickerson, Manager of the Elks Club, 607 Parkview Street, Los Angeles 57.

THE PHYSICIAN'S *Bookshelf*

THE PATHOLOGY OF TRAUMA—2nd Edition. Alan Richards Moritz, M.D., Professor of Pathology and Director of the Institute of Pathology of the School of Medicine, Western Reserve University, Cleveland. Lea & Febiger, Philadelphia, 1954. 414 pages, $8.50.

Generally, the book is divided into chapters discussing and detailing the causes and the effects of mechanical injury on the various organ systems of the body. While the bulk of the volume is so specialized as not to be of general interest to all physicians, the physical principles of injury, the oft-discussed relation of trauma to tumors, etc., might be worthwhile reading for the practitioner.

While the book is said, in the preface, to be enlarged and thoroughly revised, a paragraph by paragraph comparison shows relatively modest change from the first edition. The chapter on mechanical injuries now touches on the kinetics of forces causing injury. The chapter on trauma and infection has been enlarged to offer more detail on specific infections and has new references added and a few removed. The last chapter dealing with the medicolegal autopsy merely touches on the subject and thus offers little to the experienced pathologist; and it might be better for the uninitiated to turn to one of the readily available more complete works for reading or reference on the subject.

Any practicing pathologist or physician engaged in medicolegal activities would do well to be familiar with the book.

Any physician who has occasion to treat any appreciable number of traumatic cases would gain from a familiarity with the subject matter of the text.

Any physician who is to be called on to testify about any traumatic death or who is to give expert opinion, would find himself better prepared to give such opinion in a manner most helpful to the court, after referring to the volume.

* * *

SALT AND THE HEART. Edward T. Yorke, M.D., Attending Cardiologist, Alexian Brothers Hospital, Associate Cardiologist, St. Elizabeth Hospital, Dispensary Physician, Elizabeth General Hospital, Elizabeth, N. J., Consultant in Medicine, Rahway Hospital, Rahway, N. J. Drapkin Books, 36 East 19th Street, Linden, N. J., 1953. 83 pages, $3.45.

For the perplexed patient who is initially confronted with the rigors of a restricted sodium intake this monograph will adequately supplement the physician's instructions. It begins with a prologue concerning the tribulations of a retired seafarer (identified as an "Old Salt") who suffers from paroxysmal nocturnal dyspnoea. It ends with detailed information on how to interpret the labels on boxes of unsalted crackers.

Several preliminary chapters are devoted to brief descriptions of various physiologic derangements, fluid balance and exogenous salt requirements as well as the mechanism of edema formation based on the "forward failure" concept. Written in lay terms the material occasionally suffers from oversimplification especially when alluding to such complexities as the low salt syndrome, cation exchange resins and salt-losing nephritis.

The real value of the book is found in the latter part which contains simple conversion tables, a compilation of the sodium content of practically all foods, household hints for removing salt from numerous items, recipes for preparing menus and excellent advice on evaluating so-called low sodium products. Numerical sodium ratings (mg. per 100 gm.) are listed for each food and will certainly be appreciated by the bridge-playing homemaker accustomed to honor-counts.

* * *

CLINICAL ENDOCRINOLOGY. Karl E. Paschkis, M.D., Associate Professor of Medicine, Assistant Professor of Physiology, Director of the Division of Endocrine and Cancer Research, Jefferson Medical College; Abraham E. Rakoff, M.D., Clinical Professor of Obstetrics and Gynecologic Endocrinology, Jefferson Medical College; and Abraham Cantarow, M.D., Professor of Biochemistry, Jefferson Medical College. Paul B. Hoeber, Inc., 49 East 33rd Street, New York, 1954. 830 pages, 253 illustrations, 5 in full color, $16.00.

This book will find its place among the best in the field of endocrinology and metabolism. It will best serve the student and practicing physician as a reference volume, yet despite its size and all-inclusiveness, it is brief and readable; controversial subjects are generally avoided. A good bibliography makes the book of additional value to the specialist. The material is presented for each gland in the order of embryology, anatomy, histology, physiology, pathology, pathologic physiology, diagnosis and treatment. Hence, answers to questions are easily found. Conditions of hypo- and hyperfunction of each gland are discussed in separate chapters. Emphasis is placed on pathologic physiology and integration of clinical and laboratory data. The section on diabetes is brief and that on the ovaries extensive. Chapters on obesity and methods are included. A list of commercial hormone preparations will be helpful. The illustrations, especially the photomicrographs, are very good. This book is highly recommended as a general text in clinical endocrinology.

* * *

MANUAL OF TROPICAL MEDICINE, A—2nd edition. Thomas T. Mackie, M.D., Chairman, American Foundation for Tropical Medicine; George W. Hunter, III, Ph.D., and C. Brooke Worth, M.D. W. B. Saunders Company, Philadelphia, 1954. 907 pages, 304 illustrations, $12.00.

This manual, originally published during World War II under the auspices of the National Research Council, served the Armed Forces well and was enthusiastically received by others who studied and later practiced medicine in the tropics. In this second edition it fulfills even more effectively the constant need for an accurate, critically selected and condensed text on disease in the warm countries. An over-all review has been accomplished with the assistance of an imposing list of investigators thoroughly familiar with certain tropical diseases. This type of cooperation, so essential in modern compilations, was not solicited in the section of bacterial diseases. Because sometimes old sum-

maries were followed, some aspects of some infections escaped attention. These oversights are minor, even insignificant, deficiencies, completely submerged in the general high quality of the book. The illustrations are numerous and illustrative; the index (52 pages) is invaluable. The authors have set an excellent example in this index; the listings are logical and its coverage of the text is complete. Equally welcome to any physician or public health worker in the tropics are the descriptions of carefully selected and fully proven diagnostic laboratory procedures essential in tropical medicine. Any physician reading this manual will receive a good introduction to the ecology of human disease under the impact of environmental provocative factors.

* * *

THE THYROID—A Physiological, Pathological, Clinical and Surgical Study. T. Levitt, M.A., F.R.C.S.(Eng.), F.R.C.S.(Ed.), F.R.C.S.I., Hunterian Professor of the Royal College of Surgeons. E. & S. Livingstone, Ltd., London. Distributed through Williams and Wilkins Co., Baltimore, 1954. 606 pages, $20.00.

This volume is written to elaborate upon and attempt to substantiate the author's hypothesis that "abnormalities of the thyroid gland are not isolated diseases, but are phases in an evolving continuum." He has found it expedient to describe six progressive phases of the toxic gland, as follows: (1) epithelial hyperplasia, (2) lymphoepithelial hyperplasia, (3) focal lymphoid hyperplasia, (4) diffuse lymphoid hyperplasia, (5) fibrolymphoid hyperplasia, (6) fibrosis.

With such a purpose and with a new classification, it is not surprising that the arrangement of the subject matter is novel. The reviewer, however, found the book difficult to read because of awkward wording, unclear concepts, and particularly because many statements of controversial nature are offered as fact with little or no qualification. The volume is profusely and beautifully illustrated in color as well as in black and white. In actual fact, the volume becomes more a text than an elaboration of an hypothesis, because it includes a discussion of all phases of thyroidology, from physiological considerations to surgical technique, albeit with the author's personal orientation. The special student of thyroid disease may find the book of interest because of its photography and the style of presentation, but the book is not recommended as a textbook for the medical student or general practitioner.

* * *

FRENCH'S INDEX OF DIFFERENTIAL DIAGNOSIS—Seventh Edition. Arthur H. Douthwaite, M.D., Senior Physician, Guy's Hospital; Honorary Physician, All Saints' Hospital for Genito-Urinary Diseases. The Williams and Wilkins Company, Baltimore, 1954. 1046 pages, 731 illustrations, 200 in color, $20.00.

When the reviewer was a student, French's *Index of Differential Diagnosis* commanded a degree of awe and admiration which gave it an almost biblical quality. Since that time, physiological and etiological concepts have replaced the descriptive clinical patterns which French so diligently and comprehensively gathered into the *Index of Differential Diagnosis*, and other books have helped to civilize the wilderness into which French so bravely pioneered.

This is the first edition edited by Dr. A. A. Douthwaite. It has been completely revised or rewritten and has a number of new contributors. It has likewise been pruned to produce a more compact work; and much obsolete material has been weeded out and replaced. The indexing is still excellent.

However, the reviewer feels that a good deal remains to be done to give the book the status it once commanded. There is still too much retention of some of the older terms and concepts. (For example, Napkin Region Eruptions—applied to infants and adults alike—requires a dictionary to set the American student straight.) There are not nearly enough tables of differential diagnosis and many of those present should be more inclusive. There are many excellent illustrations, a number of which are in color, but also quite a few which could well have been relegated to the limbo of the first or second edition.

To sum it up, too much of the book may be epitomized by the discussion on menorrhagia (pages 469-472): There is the usual definition and differentiation from metrorrhagia and methostaxis. There is the inclusive tabulation of the causes, divided into four categories. Then the contributor makes the revealing summary statement: "Since the discovery of the ovarian hormones and their activator the anterior pituitary gland, our conceptions of the causes of excessive menstrual loss have undergone considerable changes. It is a question whether some of the causes given in the above list should not be discarded, ovarian dysfunction being the true underlying cause."

Regardless of all this, the reviewer feels that there is a place for the *Index of Differential Diagnosis* on the reference shelf of medical libraries and as a one-volume consultant to be at the elbow of the medical practitioner. He recommends it for such purposes.

* * *

RECONSTRUCTIVE SURGERY OF THE EYELIDS—2nd Edition. Wendell L. Hughes, M.D., F.A.C.S., Hempstead, N. Y., The C. V. Mosby Company, St. Louis, 1954. 260 pages, 268 illustrations, $8.50.

This book, now in its second edition, is very worthwhile for ophthalmic as well as plastic surgeons. The book deals with historical data as well as present-day techniques. There are 210 pages of subject matter followed by a very extensive list of reference works.

There is a definite need for this type of book because not only is lid reconstruction cosmetic but must be done properly to protect and preserve the integrity of the eyeball. It is essential that this type of surgery not be attempted without proper knowledge of the subject.

* * *

WINE AS FOOD AND MEDICINE. Salvatore P. Lucia, A.B., M.D., Sc.D., F.A.C.P., Professor of Medicine, U. C. School of Medicine. The Blakiston Company, Inc., New York, 1954. 149 pages, $3.00.

An extremely interesting and worthwhile book describing the value of the *temperate* use of wine as a food and as a therapeutic agent. Its effect upon the psyche and various organ systems is thoroughly discussed. There is an extensive bibliography.

The scientific accuracy of the book is slightly impaired by reference to many experimental studies which are obsolete and to unsupported opinions from old writings.

* * *

ENDEMIC GOITER—The Adaptation of Man to Iodine Deficiency. John B. Stanbury, M.D., Gordon L. Brownell, Ph.D., Douglas S. Riggs, M.D., and Hector Perinetti, M.D., Juan Itoiz, Ph.D., Enrique B. Del Castillo, M.D. Harvard University Press, Cambridge, Mass., 1954. 209 pages, $4.00.

This is a fascinating and well-written account of the fundamental nature of endemic (iodine deficient) goiter. The authors have described their studies upon goitrous patients living on the Mendoza slopes of the Argentine Andes, an area known to be deficient in iodine. Such a study might never have been possible had not a team of American workers cooperated with Argentine physicians and officials and completed the study just prior to the introduction of iodized salt for goiter prophylaxis. Following a very interesting account of the locale of the study and a

description of the clinical material, the work proceeds to discussions of the metabolism of iodine, physiological principles governing thyroid function, and newer methods of evaluating thyroid function, including application of isotope techniques.

The investigation of the Mendoza subjects is reported in considerable detail and includes observations of the effects of treatment with iodine, thyroid, antithyroid drugs, and thyrotropin.

Summaries and useful bibliographies are included at the end of each chapter, and a final summary chapter serves as a useful review and outlines areas of suggested research.

This book is a classic in its field and is destined to remain an outstanding reference source in the fields of endocrinology and metabolism for many years to come. It can be highly recommended to interested medical students, practicing physicians, endocrinologists, biophysicists, and biochemists.

* * *

PEDIATRIC PROBLEMS IN CLINICAL PRACTICE—Special Medical and Psychological Aspects. H. Michal-Smith, Ph.D., Editor, Research Associate in Pediatrics, New York Medical College, Chief Clinical Psychologist, Flower and Fifth Avenue Hospital. Grune & Stratton, New York, 1954. 310 pages, $5.50.

The special types of problems dealt with in this book are those of the child who is emotionally disturbed, schizophrenic, mentally retarded, brain-injured, orthopedically handicapped, allergic, diabetic, epileptic, tubercular, or handicapped for cardiac reasons or by cerebral palsy. Each such child has a chapter devoted to him, written by one of the 13 contributors to the volume. The author has written an interesting chapter on the mentally retarded child. Other contributors include Arnold Gesell, Lauretta Bender, Pricilla White, William Lennox, Bret Ratner, Winthrop Phelps and several others.

The volume should make a useful addition to the library of those pediatricians or other physicians dealing with children handicapped by the problems mentioned.

* * *

SYNOPSIS OF ANESTHESIA, A—3rd Edition. J. Alfred Lee, M.R.C.S., L.R.C.P., M.M.S.A., D.A., F.F.A.R.C.S., Consultant Anesthetist to the Southend-on-Sea Hospital, etc. The Williams and Wilkins Company, Baltimore, 1953. 483 pages, $3.50.

This book is essentially a compendium of knowledge in the field of anesthesiology. As such, it fills a great need in the library of the expert, occasional and resident anesthesiologist in providing accurate surveys in outline and short discussion form the basic information required to understand the ever-broadening field of anesthesiology. A great deal of reference material is cited for further reading; of necessity the bulk of the material so listed is from foreign journals. Most of these are, however, available in any library maintained by local medical societies.

A great many of the chapters have been enlarged and expanded from the second edition of this book and two short chapters have been added; one on the reduction of bleeding during operations and the other on the therapeutic aspects of anesthesia. These are short but packed with information.

Of minor nuisance value is the continued use of a nomenclature common to the British Isles. American synonyms are included frequently enough to prevent complete bewilderment, but it would be of great assistance to refer to body weight in "pounds" rather than the more unfamiliar and cumbersome "stone." A great many pages are devoted to the description and operation of English apparatus not likely to be found in this country. Aside from these minor faults which can be quickly omitted without great loss of time, this book contains more information of an accurate nature than any other we have found.

The chapters on anatomy, physiology and pharmacology are gems and the precision and thoroughness of their presentation can well make some larger, more pretentious textbooks blush for shame.

On the whole, the book is stimulating and as complete as an expanded outline can be. We heartily recommend it to anyone working or interested in the field of anesthesiology.

* * *

MODERN TRENDS IN DERMATOLOGY (Second Series). Edited by R. M. B. MacKenna, M.A., M.D.(Camb.), F.R.C.P.(Lond.), Physician in Charge, Dermatological Department, St. Bartholomew's Hospital. Paul B. Hoeber, Inc., New York, 1954. 338 pages, $12.00.

This book is as outstanding as the first edition. Seventeen separate essays by seventeen authors review and bring up-to-date important developments in the field of dermatology.

Chapter I presents a scholarly presentation of ecology in relationship to dermatology. Chapter II, in a critical evaluation of psychosomatic medicine in relationship to dermatology, is the best review of this subject which has appeared in years. Haserick's chapter on the blood factors in lupus erythematosus is beautifully illustrated and clearly written. New developments such as cyto diagnosis in dermatology, the pathogenesis of tinea capitis and beta-ray therapy are handled in a scholarly fashion.

A book of this sort is extremely useful in the sense of a complete, up-to-date, interpretative view of the modern trends which may have escaped the attention of one who does not have an opportunity to read widely the medical journals of the world.

* * *

DERMATOLOGIC MEDICATIONS. Marguerite Rush Lerner, M.D., Resident, Department of Dermatology, and Aaron Bunsen Lerner, M.D., Ph.D., Associate Professor of Dermatology, University of Oregon Medical School, Portland. The Year Book Publishers, Inc., 200 East Illinois, Chicago, 1954. 183 pages, $3.00.

This is a handbook intended as a reference for students and busy practitioners who desire useful and up-to-date information on dermatologic therapeutics.

The publication is divided into two sections: therapeutic agents, and treatment regimens. In the first section, commonly used agents are discussed as to indications, chemical structure, mode of action in skin disease, and application. In the second section, therapeutic regimens are outlined for various common dermatoses.

By limiting the information to a practical basis, the authors have succeeded in limiting the size of the volume, yet it is surprisingly complete.

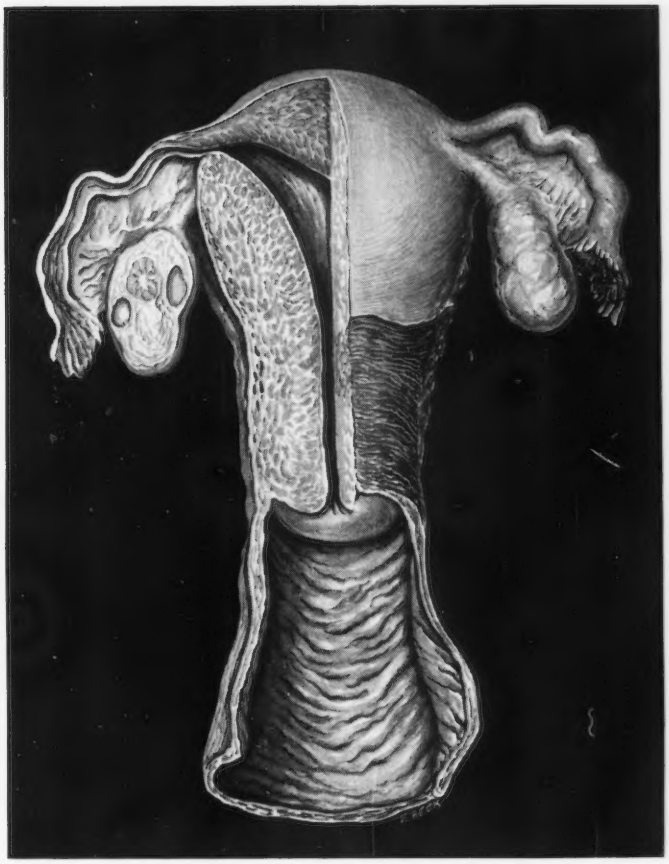
This handbook can be recommended to students and busy practitioners, regardless of specialty, who are interested in skin disease.

* * *

HANDBOOK ON DISEASES OF CHILDREN—Including Dietetics and the Common Fevers—7th Edition. Bruce Williamson, M.D. (Edin.), F.R.C.P. (Lond.), Physician, Children's Department, Royal Northern Hospital. E. & S. Livingstone Ltd.; distributed in U.S.A. by Williams and Wilkins Co., Baltimore, 1953. 467 pages, $5.00.

This Handbook on Diseases of Children is in its seventh edition. Appearing first in 1933, it has been periodically revised. Many of the viewpoints expressed are not in conformity with current American thinking. It should be more popular among the older practitioners of the British Empire than with recent graduates from schools of this country.

Vallestril insures maximal estrogenic potency with minimal activity on the endometrium and thus singular freedom from withdrawal bleeding.



Unique "Target Action" of Vallestril®

Vallestril has been found to exert its selective "target action" on the vaginal mucosa. Conversely the effect on the uterus or endometrium is negligible.

In pharmacologic studies, using the Allen-Doisy technic, Vallestril was found to be more active than estradiol and twice as potent as estrone on the vaginal mucosa. On the other hand, using the Rubin technic, Vallestril was found to have only one-tenth the activity of estrone on the uterus, a suggested explanation of its low incidence of withdrawal bleeding.

In clinical evaluation, covering a period of two and one-half years, Vallestril was found* to be "an effective synthetic estrogen . . . singularly free from toxic effects and complications, especially uterine bleeding. . . . The beneficial effect of the medication appeared within three or four days in most menopausal patients . . . . failure to encounter withdrawal bleeding in any patient was most gratifying. . . ."

Such unwanted reactions as nausea, mastalgia and edema also occur less frequently with Vallestril.

Vallestril is preferentially indicated whenever estrogens are of value: The menopausal syndrome; pain of postmenopausal osteoporosis; pain of osseous metastases of prostatic cancer.

Dosage: Menopause—3 mg. (1 tablet) two or three times daily for two or three weeks, followed by 3 or 6 mg. daily for one month. Supplied only in scored tablets of 3 mg. G. D. Searle & Co., Research in the Service of Medicine.

———

*Sturnick, M. I., and Gargill, S. L.: New England J. Med. 247:829 (Nov. 27) 1952.

Gamma Globulin Shown More Effective

A restudy of gamma globulin shows that it is slightly more effective against poliomyelitis than it appeared before, it was reported recently by a team of investigators aided by the National Foundation for Infantile Paralysis.

Laboratory tests, not available immediately after the 1951-52 field trials of GG, were used to reanalyze its value. Several changes in results appeared, according to scientists reporting in a recent issue of the *Journal of the American Medical Association.*

Conclusions by officials evaluating GG after the field trials were that it gave significant protection. These officials later said that evidence from the 1953 mass inoculations of the serum did not demonstrate whether GG did or did not have any effect against polio. Dr. William McD. Hammon, Pittsburgh, a leading member of the investigators, said then that the serum "has an extremely limited application in the field of preventive medicine and will not produce dramatic results in general use." The investigators said no conclusions could be reached from this mass use of GG because the inoculations were not made under experimental control conditions.

They conclude from the latest study, however, that "unless better evidence has become available, use of gamma globulin after recognized exposure among family contacts or any other contacts of known cases is supported by suggestive, although admittedly inconclusive, experimental data."

"At least, there is no basis for concluding that gamma globulin will not protect under such conditions," they said.

As a result of the new study, public health officers have been notified to use gamma globulin for family groups, where persons are more likely already to be in the incubation period. The order reverses the original "large-group-inoculation-only" agreement between the U. S. Public Health Service, the National Foundation for Infantile Paralysis, the American National Red Cross, and the Office of Defense Mobilization.

Evidence from the new laboratory analysis suggests that protection by GG "began to have a noticeable effect late in the incubation period, was most effective when given at about the time of exposure or one week before, and continued with slowly diminishing effect for six to eight weeks."

According to the National Foundation for Infantile Paralysis, which sponsors the GG studies, the serum could be considered "the weapon that held the fort until the big guns could be brought up." The foundation said GG is being used while waiting for the results of the tests on the "big gun"—the trial vaccine developed by Dr. Jonas E. Salk of the University of Pittsburgh.

The latest report said that the use of GG "would not ordinarily have been considered if anything else

(Continued on Page 72)

The product you have been looking for to increase appetite and growth

OREXIN
(STUART)

UNIQUE COMBINATION

combines the 3 vitamins important for appetite and growth.

ONE TABLET CONTAINS:

B_{12}.....25 mcg.
B_6 ..... 5 mg.
B_1 .....10 mg.

DOSE: 1 tablet daily

UNIQUE FORM

Pleasant tasting, specially constructed soft tablet (Softab†) melts in the mouth.

If liquid is preferred OREXIN tablet dissolves quickly in teaspoon of water.

Available at all pharmacies
in bottles of 30 and 100 tablets

THE STUART COMPANY **Stuart** Pasadena 1, California

† *Trade Mark*

Why physicians prescribe more 'Drilitol' than any other antibiotic intranasal preparation

1. 'Drilitol' contains two antibiotics.

In combination, these antibiotics—anti-grampositive gramicidin and anti-gramnegative polymyxin—are active against the wide range of bacteria commonly found in intranasal infections.

2. 'Drilitol' contains a decongestant.

Paredrine* Hydrobromide rapidly opens blocked intranasal airways, promotes ventilation and drainage, and facilitates dispersion of Drilitol's components throughout the nasal cavity.

3. 'Drilitol' contains an antihistaminic.

Thenylpyramine hydrochloride counteracts local allergic manifestations. Also, when applied topically, it produces an antipruritic and procaine-like local anesthetic effect that is soothing to inflamed mucosa.

Formula: Contains gramicidin, 0.005%; polymyxin B sulfate, 500 U/cc.; thenylpyramine hydrochloride, 0.2%; 'Paredrine' Hydrobromide (hydroxyamphetamine hydrobromide, S.K.F.), 1%. Preserved with thimerosal, 1:100,000.

*T.M. Reg. U.S. Pat. Off. for hydroxyamphetamine hydrobromide, S.K.F.

4. 'Drilitol' obviates fear of sensitization to—and organisms resistant to—antibiotics widely used systemically.

Because 'Drilitol' contains two antibiotics that are *not* in widespread systemic use, you avoid the danger of sensitizing the patient to—and of developing in him organisms resistant to—penicillin or the "mycins", which are so frequently used systemically in serious infections.

5. 'Drilitol' is available in two forms:

'Drilitol'† Spraypak'

convenient plastic squeeze bottle to provide superior coverage of the nasal mucosa in a fine, even mist.

'Drilitol' Solution

with special "dosage-adjusted" dropper that delivers the recommended dose.

Smith, Kline & French Laboratories, Philadelphia

†T.M. Reg. U.S. Pat. Off. 'Spraypak' Trademark

Rural Health To Push 3-Point Program

The American Medical Association Council on Rural Health and its advisory committee, made up of representatives from several national, agricultural and educational organizations, held a three-day meeting in Chicago recently and formulated a three-point program on which the council will concentrate during the next year. The three points are:

1. More doctor participation with lay groups. Rural people are asking for and welcoming assistance and advice.
2. More cooperation with country newspapers and farm journals, in supplying health information.
3. Bringing rural people closer together by suggesting that county medical societies invite county extension agents and farm leaders to appear on their programs and that rural organizations invite physicians to speak to them.

Plans for the forthcoming Tenth National Conference on Rural Health were formulated. This annual conference is to be held at the Schroeder Hotel, Milwaukee, February 24-26, 1955. As in previous years, the Thursday morning session preceding the formal opening of the conference will be for physicians. This meeting will be devoted to problems confronting physicians who are members of state rural health committees or committees handling rural health programs. The formal session of this conference will begin Thursday afternoon and continue through the Saturday luncheon session.

—The A.M.A. Secretary's Letter

in hypertension

Nitranitol with Rauwolfia

tandem action for safe, gradual, prolonged relief

Nitranitol for prompt relief of distressing symptoms... slower acting Rauwolfia for prolonged hypotensive and quieting action--no lag in symptom relief. The combination means normal life sooner for your essential hypertensives... no jolting of the vasomotor reflexes... side effects are uncommon.

write: Nitranitol R.S. (RAUWOLFIA SERPENTINA)

for a more normal life sooner for your hypertensive patient

Rx INFORMATION

Nitranitol

SIX DOSAGE FORMS

Nitranitol R.S.
for direct vasodilation plus the added central hypotensive and calming actions of Rauwolfia serpentina

Mannitol hexanitrate . 32 mg.
Rauwolfia serpentina (alseroxylon fraction) . 0.5 mg.

Nitranitol
for safe, gradual, prolonged vasodilation

Mannitol hexanitrate . 32 mg.

Nitranitol with Phenobarbital
for the nervous hypertensive

Mannitol hexanitrate . 32 mg.
Phenobarbital . . . . . 16 mg.

Nitranitol with Phenobarbital and Rutin*
for protection in capillary fragility

with Rutin . . . . . 20 mg.

Nitranitol with Phenobarbital and Theophylline*
in threatened cardiac failure

with Theophylline . . 100 mg.

Nitranitol P.V.*
in refractory cases

with alkavervir . . . . . 1 mg.
(alkaloidal fraction of Veratrum viride, standardized for hypotensive activity)

DOSAGE: In blood pressures over 200 systolic, 2 tablets four times daily. In other cases, 1 or 2 tablets every four to six hours. Bottles of 100 and 1,000.

NOTE: Nitranitol is exceptionally stable, assuring uniform potency, so important in medication for your hypertensives.

*Each contains mannitol hexanitrate 32 mg. and phenobarbital 16 mg.

Merrell Since 1828

PIONEER IN MEDICINE FOR OVER 125 YEARS

THE WM. S. MERRELL COMPANY New York · CINCINNATI · St. Thomas, Ontario

T. M. NITRANITOL®, 'NITRANITOL P.V.' AND 'NITRANITOL R.S.'

Do you sometimes feel that a patient would benefit from drinking less coffee, because he is "caffein sensitive"? Why not tell him he can drink all the coffee he wants, as long as it is Sanka Coffee—97% caffein-free?

New, Extra-Rich Sanka is a wonderful coffee, Doctor. You'll enjoy it yourself.

Products of General Foods

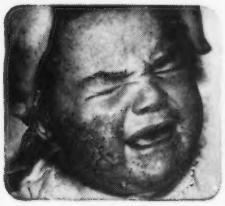
SANKA COFFEE

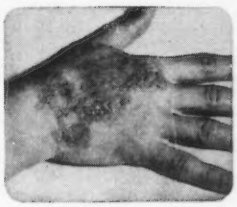
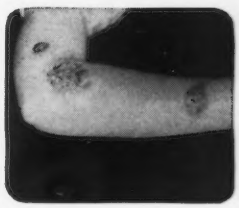
DELICIOUS IN EITHER INSTANT OR REGULAR FORM

Wherever TAR is indicated.....

TARBONIS cream

provides effective control



NON-GREASY • NON-STAINING • COSMETICALLY ACCEPTABLE

Tarbonis supplies the benefits of time-tested tar without its objectionable features—assures patient cooperation.

Easily applied, quickly and completely absorbed into the skin, Tarbonis stops itching and provides rapid relief. It is free of tarry odor, is pleasantly scented, and cosmetically acceptable to the most fastidious. The vanishing cream base permits deeper, more effective penetration without staining or soiling.

INDICATIONS

Eczema, infantile eczema, psoriasis, folliculitis, seborrheic dermatitis, intertrigo, pityriasis, dyshidrosis, tinea cruris, varicose ulcers, and other stubborn dermatoses.

Write today for a clinical trial supply.

AVAILABLE

On prescription from all druggists in 2¼ oz., 8 oz., and 1 lb. jars.

REED & CARNRICK

JERSEY CITY 6, NEW JERSEY

WHEN ITCHING is a severe problem

HISTAR

healing topical analgesic combines antihistaminic and coal tar therapy

Histamine Relieves Pain In Blood Vessel Diseases

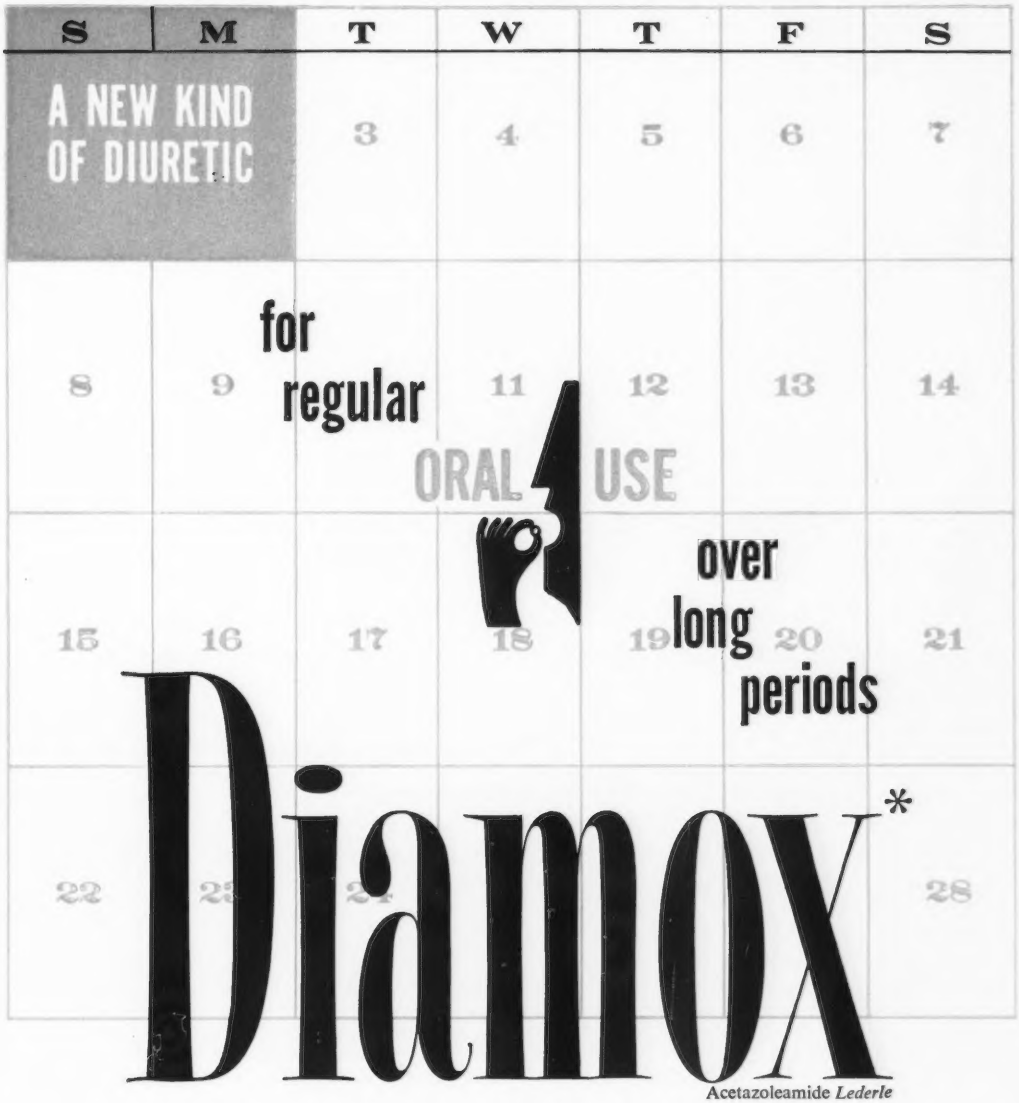
The body chemical that makes hay fever patients suffer can bring relief from disabling leg pains to patients with blood vessel diseases, a New York City physician recently said.

Dr. Isidor Mufson reported in a recent issue of the *Journal of the American Medical Association* on infusions of histamine for patients with diseases of the peripheral blood vessels. The infusions helped many patients to walk again and even prevented amputation in some severe cases.

Diseases resulting in closure of the vessels, such as arteriosclerosis, have become more important as causes of death because they occur with advancing age and because our life span has been increased, he said. Insufficient circulation in those vessels is "rarely cured by removing the cause" but frequently can be helped by expanding the nearby vessels.

Dr. Mufson said histamine, acting as a dilator, also may bring about permanent structural changes which prolong the successful effect of the treatment. Histamine is a natural body product, and its unusual concentration in the blood stream is what causes the swollen nose membranes and tearful eyes of the hay fever sufferer. It is too strong to be in-

(Continued on Page 66)



DIAMOX *Lederle* is new in mode of action. Not a mercurial drug or a xanthine derivative, it produces prompt and copious diuresis by means of specific carbonic anhydrase inhibition. It is remarkably non-toxic, even in amounts far greater than the therapeutic dose. DIAMOX does not accumulate in the body, but is excreted quantitatively and unchanged, in the urine. It may, therefore, be given repeatedly.

Cardiac patients may be maintained edema-free for many weeks or months.

Available in scored tablets (250 mg.)
Dosage: 1 to 1½ tablets each morning, according to weight.

*Reg. U.S. Pat. Off.

Lederle

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER, NEW YORK

chelated iron

a revolutionary chemical advance now applied to anemia therapy in

FERROLIP® PLUS

FERROLIP PLUS

- **provides an entirely new, better tolerated and better utilized chelated iron (Ferrolip) . . .**
- **plus every known basic hemogenic agent in therapeutic potencies . . .**
- **for dramatic clinical response in primary and secondary anemias**

Each Ferrolip Plus Capsule contains:

Iron Choline Citrate† (Ferrolip)	200 mg.
Vitamin B_{12} Crystalline, U.S.P.	10 mcg.
Folic Acid	0.5 mg.
Ascorbic Acid	50 mg.
Thiamine HCl	2 mg.
Riboflavin	1 mg.
Pyridoxine HCl	0.5 mg.
Desiccated Duodenum*	100 mg.
Liver–Gastric Tissue*	100 mg.

*Contains Intrinsic Factor
†U.S. Patent No. 2575611

ENTIRELY NEW . . .

By means of a special type of chemical bonding known as "chelation," ionic iron in Ferrolip is surrounded by claw-like molecular rings of a "chelating" agent (choline dihydrogen citrate).

EXCEPTIONALLY WELL TOLERATED . . .

The chelated iron complex (Ferrolip) releases iron gradually in the intestine. Since no mass discharge of free iron takes place to irritate the gastrointestinal tract, chelated iron is better tolerated.

BETTER UPTAKE . . .

Better uptake also occurs since chelated iron is soluble throughout the entire pH range of the intestinal tract.

1 to 3 capsules daily.

Bottles of 100 and 1000.

MORE SATISFIED PATIENTS WITH BETTER TOLERATED FERROLIP PLUS

FLINT, EATON & COMPANY • DECATUR, ILLINOIS
Western Branch: 112 Pomona Avenue, Brea, California

Why...*you should consider*

HYPERLOID* (Rauwolfia Serpentina)

...in the treatment of hypertension

In the progress of medical therapy, there is, of necessity, a continuing isolation and formulation of new drugs, or new combinations of those that have been time-tested.

HYPERLOID is a new product derived from the ancient Rauwolfia Serpentina, well known in India with recognized efficacy.

The cumulative effect of any drug to be of permanent value to the medical profession, must be as free from undesirable side effects as is possible. This is true of HYPERLOID.

In HYPERLOID, Persón and Covey have produced a hypotensive of controllable and constant potency for the treatment of hypertension. It effects a relaxing sedation, mild bradycardia, and a sense of well being.

While most effective in mild and labile hypertension, HYPERLOID is useful in virtually every case of essential hypertension. It is completely safe, lowering the blood pressure slowly and gradually. There are no serious toxic or side effects and no known contraindications.

It is compounded as a sugar-coated tablet derived from the whole root.

Why the whole root?

Hypotensive activity of Rauwolfia is not confined to one single alkaloid. Several of the alkaloids have a relaxing activity, some of which would be lost by the use of one alkaloid alone. Too, the non-alkaloid resin fraction, which is reported to have additional sedative effect, is present in HYPERLOID, but is not present in any of the alkaloid extracts. There are the same side effects in all three types of Rauwolfia products – extracts, single alkaloid, or whole root. Use of the whole root offers these additional advantages.

Constant, unvarying potency is achieved even in whole root formulation, through animal tests and assay of alkaloid content, allowing predictable results. Tolerance does not develop, thus controlled dosage is possible, achieving an even effective level.

It may also be used successfully in combination with lower dosage requirements of more potent hypotensive agents which in larger quantities are prone to produce toxic or undesirable side-effects.

Its potency is based on the milligrams of alkaloids as the hypotensive effect lies in the alkaloid content of rauwolfia. This in HYPERLOID is constant at 2 mg. per tablet. And of some importance is the fact that by the method of formulation, it is possible to produce HYPERLOID in a more inexpensive form than hitherto possible. This in itself is an especially desirable factor in any long continuing treatment in the control and management of hypertension.

We have just put aside a quantity of sample packages for further consideration. Just ask your secretary to fill out this coupon and mail it today.

Persón & Covey

* Trademark

Persón & Covey
1354 E. Colorado St.
Glendale, California
Gentlemen:
Please send samples of Hyperloid for clinical trial.
NAME_____, M.D.
STREET_____
CITY_____ STATE_____

Gratifying relief from painful urinary symptoms

PYRIDIUM®

(PHENYLAZO-DIAMINO-PYRIDINE HCL)

In a matter of minutes after ingestion, the soothing, colorful action of PYRIDIUM allays physically and psychologically the acute dysuria, urgency and frequency that accompany pyelonephritis, cystitis, prostatitis and urethritis.[1]

PYRIDIUM is non-toxic and compatible with sulfonamides and antibiotics. Thus, its concomitant use with antibacterials poses no additional problem in medical management.

1. Fetter, T.R., Delaware State Med. J. **25**:309, Nov. 1953.

SUPPLIED: 0.1 Gm. (1½ gr.) tablets, in vials of 12 and bottles of 50.

PYRIDIUM *is the registered trade-mark of Nepera Chemical Co., Inc. for its brand of phenylazo-diamino-pyridine HCl. Sharp & Dohme, Division of Merck & Co., Inc., sole distributor in the United States.*

SHARP & DOHME
Philadelphia 1, Pa.
Division of MERCK & CO., INC.

Histamine Relieves Pain In Blood Vessel Diseases

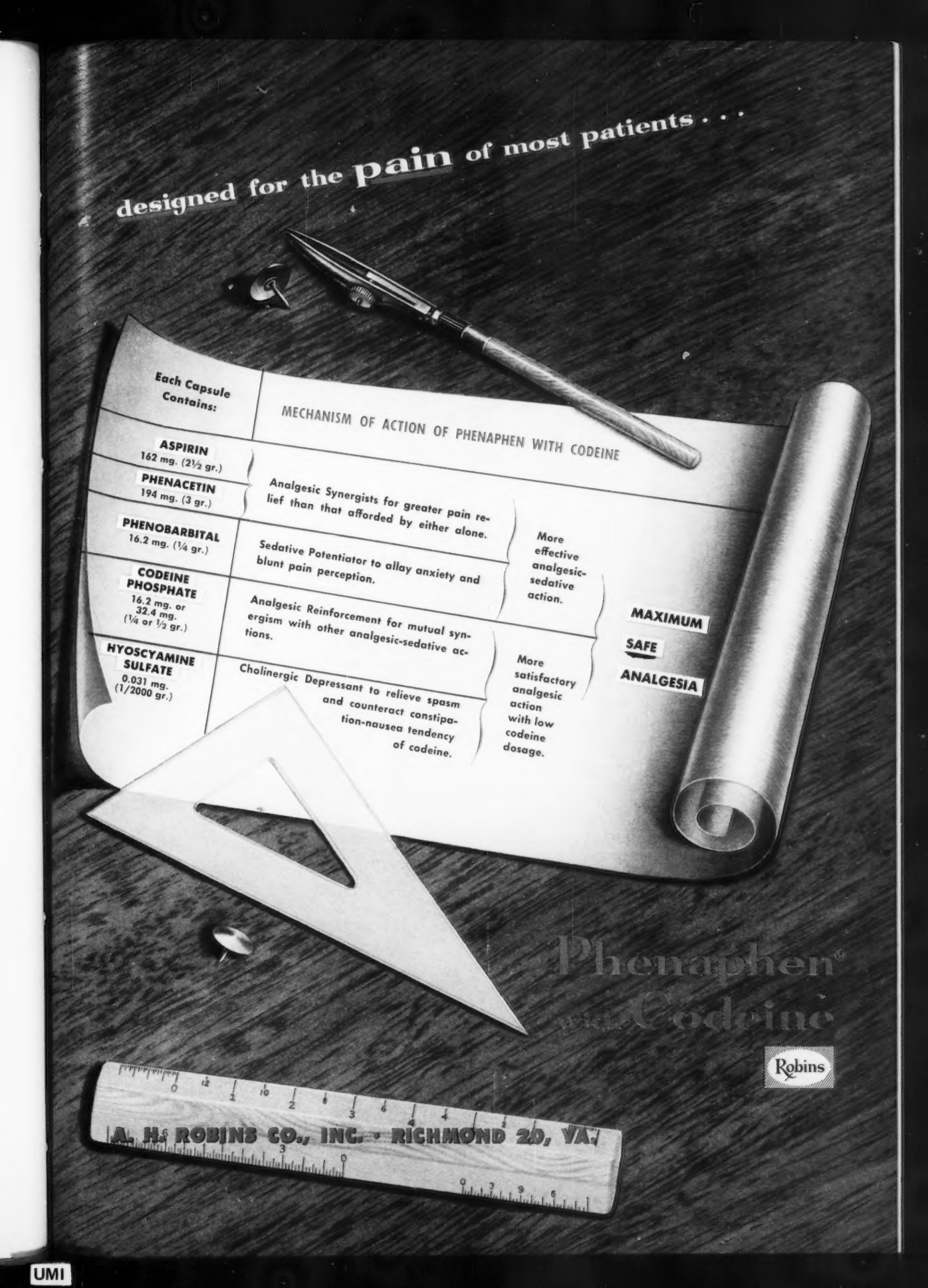
(Continued from Page 60)

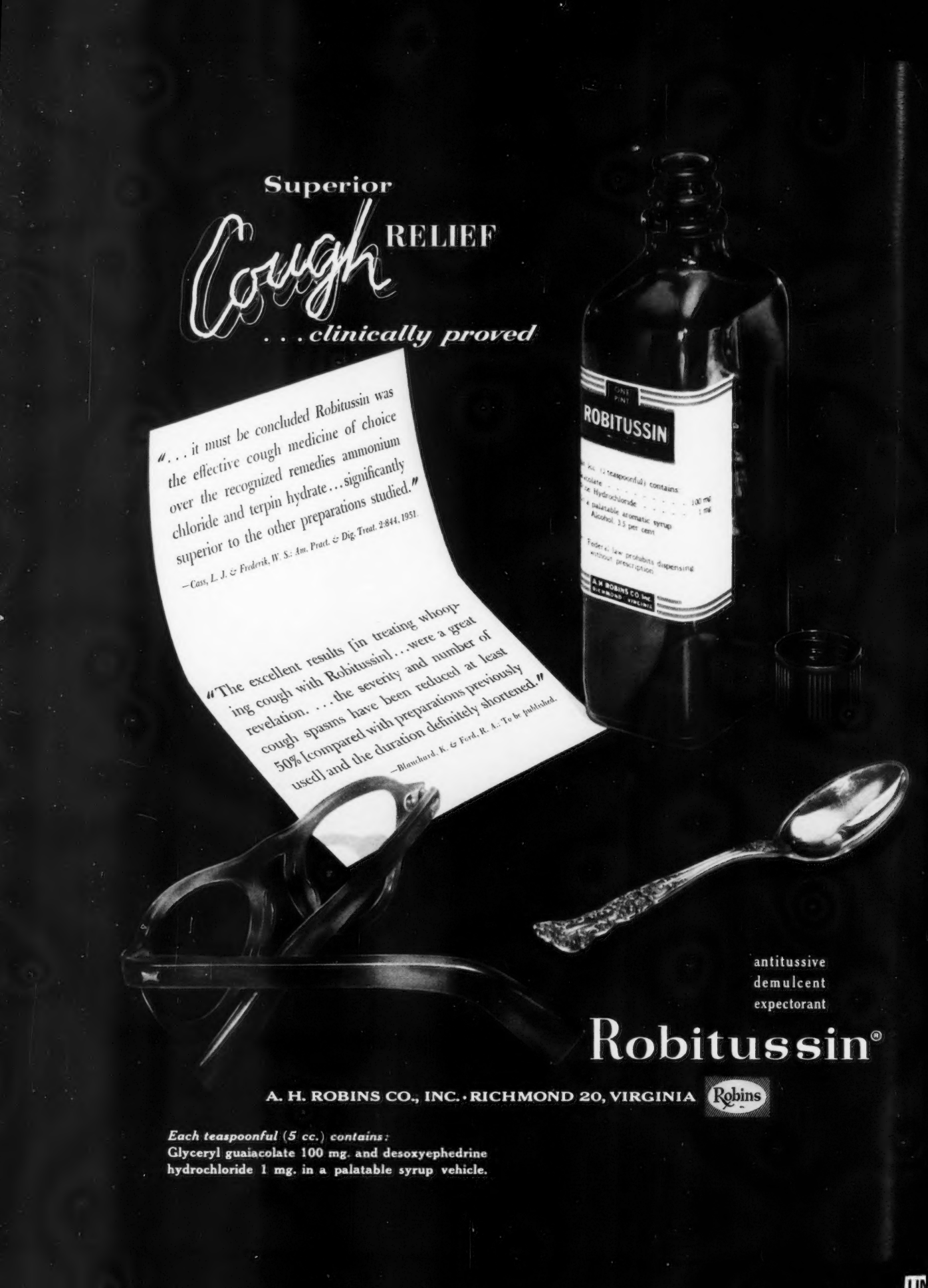
jected into the veins in concentrated form, Dr. Mufson said, but when infused, or allowed to flow by gravity into an artery, it is "safe" and "powerful."

Symptoms of peripheral blood vessel diseases include reduced tolerance to walking, and sleep-preventing pain when the patient is lying down. The pain can be relieved only by standing.

Dr. Mufson said that of 150 patients with foot and leg pain, 36 per cent were able to walk up to seven blocks after treatment with histamine. Fifty-two per cent could walk from seven blocks to an unlimited distance. Of this last group, 40 per cent remained improved for as long as two to seven years after treatment. In another group of 41 patients treated and reported by other physicians, 70 per cent walked better after histamine infusions.

Dr. Mufson said 23 patients, so disabled that amputation was being considered, returned to normal routines. Only six severe cases required amputation. Many of this whole group had gangrene. The histamine infusions plus antibiotics helped to clear up infections among the gangrenous patients, Dr. Mufson said.


designed for the pain of most patients . . .
Each Capsule Contains:
MECHANISM OF ACTION OF PHENAPHEN WITH CODEINE
ASPIRIN 162 mg. (2½ gr.)
PHENACETIN 194 mg. (3 gr.)
Analgesic Synergists for greater pain relief than that afforded by either alone.
PHENOBARBITAL 16.2 mg. (¼ gr.)
Sedative Potentiator to allay anxiety and blunt pain perception.
More effective analgesic-sedative action.
CODEINE PHOSPHATE 16.2 mg. or 32.4 mg. (¼ or ½ gr.)
Analgesic Reinforcement for mutual synergism with other analgesic-sedative actions.
HYOSCYAMINE SULFATE 0.031 mg. (1/2000 gr.)
Cholinergic Depressant to relieve spasm and counteract constipation-nausea tendency of codeine.
More satisfactory analgesic action with low codeine dosage.
MAXIMUM SAFE ANALGESIA
Phenaphen® with Codeine
Robins
A. H. ROBINS CO., INC. • RICHMOND 20, VA.


Superior
Cough RELIEF
. . . clinically proved
". . . it must be concluded Robitussin was the effective cough medicine of choice over the recognized remedies ammonium chloride and terpin hydrate . . . significantly superior to the other preparations studied."
—Cass, L. J. & Frederik, W. S.: Am. Pract. & Dig. Treat. 2:844, 1951.
"The excellent results [in treating whooping cough with Robitussin] . . . were a great revelation. . . . the severity and number of cough spasms have been reduced at least 50% [compared with preparations previously used] and the duration definitely shortened."
—Blanchard, K. & Ford, R. A.: To be published.
ROBITUSSIN
antitussive
demulcent
expectorant
Robitussin®
A. H. ROBINS CO., INC. • RICHMOND 20, VIRGINIA
Robins
Each teaspoonful (5 cc.) contains:
Glyceryl guaiacolate 100 mg. and desoxyephedrine hydrochloride 1 mg. in a palatable syrup vehicle.

Problem Drinker Should Be Helped While at Work

The "problem drinker" in industry can be cured best by keeping him on the job while helping him to solve his problem.

Allowing the employee to keep working while he tries to stop drinking is like the successful treatment of World War II casualties at the front instead of at rear bases. It gives the worker, like the soldier, "the feeling of courage and pride that one gets by staying in the fight and not retreating." Dr. Thomas H. Hogshead, of the Medical Division of E. I. du Pont de Nemours & Co., Wilmington, Del., reported on the company's program in a recent issue of *Archives of Industrial Hygiene and Occupational Medicine*, published by the American Medical Association.

"Our program is successful," he said. "An estimated 65 per cent of the cases treated have been rehabilitated. The total cost of the program is estimated at less than $100,000. The total gains cannot be measured."

The worker's "need for security, for recognition, for position, as well as his desire to belong and to be led, are all met on the job," Dr. Hogshead said. "Such motivation is of paramount importance in the approach to the problem of alcoholism in industry."

The employee considered a problem drinker is

(Continued on Page 82)

Some of the very best people use

VI-PENTA

Pleasant orange-tasting Vi-Penta Drops supply required amounts of A, C, D and principal B-complex vitamins for people of growing importance. Add to other liquids or give by the drop directly from the bottle.

In 15, 30, and 60-cc vials with calibrated dropper, *dated* to insure full potency.

VI-PENTA® HOFFMANN-LA ROCHE INC • ROCHE PARK • NUTLEY 10 • NEW JERSEY

Each 0.6 cc. contains: Vitamin A, 5,000 U.S.P. units; Vitamin D, 1,000 U.S.P. units; Vitamin B_1, 1 mg.; Vitamin B_2, 0.5 mg.; Vitamin B_6, 1 mg.; D-Panthenol (equivalent to 11.6 mg. d-calcium pantothenate), 10 mg.; Niacinamide, 10 mg.; Vitamin C, 50 mg.

Roncovite (Cobalt-Iron) has introduced a wholly new concept in anti-anemia therapy. It is based upon the unique hemopoietic stimulation produced only by cobalt. The application of this new concept has led to marked, often dramatic, advances in the successful treatment of many of the anemias.

RESULTS ARE CONCLUSIVE

The Wide Acceptance of Cobalt-Iron Therapy Stems from Findings Like These:*

High Percentage of Patient Response--

Of 42 pregnant patients, 41 maintained or improved their hemoglobin status.[1]

Better Hemoglobin Synthesis--

Cobalt accelerates utilization of iron in hemoglobin synthesis.[2]

Greater Erythropoiesis--

"...increased erythropoietic activity would preclude the need for transfusion."[3]

Rapid Improvement--

Response more rapid than intravenous iron.[4]

Optimum Results--

Cobalt should be given with iron to produce optimum results.[5]

Clinical Safety--

Even in prematures, no harmful effects were noted despite high dosage.[6]

RONCOVITE

The original, clinically proved, cobalt-iron product.

SUPPLIED

RONCOVITE TABLETS

Each enteric coated, red tablet contains:
Cobalt chloride.....15 mg.
Ferrous sulfate exsiccated.....0.2 Gm.

RONCOVITE DROPS

Each 0.6 cc. (10 drops) provides:
Cobalt chloride.....40 mg.
(Cobalt.....9.9 mg.)
Ferrous sulfate.....75 mg.

RONCOVITE-OB

Each enteric coated, red capsule-shaped tablet contains:
Cobalt chloride.....15 mg.
Ferrous sulfate exsiccated.....0.2 Gm.
Calcium lactate.....0.9 Gm.
Vitamin D.....250 units

DOSAGE

One tablet after each meal and at bedtime; 0.6 cc. (10 drops) in water, milk, fruit or vegetable juice once daily for infants and children.

*Bibliography of 192 references available on request.

1. Holly, R. G.: The Value of Iron Therapy in Pregnancy, Journal-Lancet 74:211 (June) 1954.
2. Kato, K.: Iron Cobalt Treatment of Physiologic and Nutritional Anemia in Infants, J. Pediat., 11:385 (Sept.) 1937.
3. Gardner, F.: The Use of Cobaltous Chloride in the Anemia Associated with Chronic Renal Disease, J. Lab. & Clin. Med., 41:56 (Jan.) 1953.
4. Weissbecker, L.: Cobalt Therapy, Dtsch. M. Wschr., 75:116 (1950).
5. Coles, B. L., and James, U.: The Effect of Cobalt and Iron Salts on the Anaemia of Prematurity, Arch. Disease in Childhood 29:85 (1954).
6. Quilligan, J. J., Jr.: Effect of a Cobalt-Iron Mixture on the Anemia of Prematurity, Texas St. J. Med. 50:294 (May) 1954.

LLOYD BROTHERS, INC., *Cincinnati 3, Ohio*

Gamma Globulin Shown More Effective

(Continued from page 52)

had been available. . . . This certainly does not mean that gamma globulin prophylaxis has no practical application in poliomyelitis. If further research studies with suitable controls could be carried out the most advantageous application could probably be determined."

The new study, based only on polio cases confirmed by laboratory tests and not just by clinical diagnosis, shows GG protected between about 75 and 88 per cent of those inoculated from three days to eight weeks after infection. Protection included either prevention of polio or lessening of paralysis.

The study was made by scientists from the University of Pittsburgh, the University of Pennsylvania, the Children's Hospital of Philadelphia, and the Camden Municipal Hospital for Contagious Diseases.

They said earlier conclusions about GG were inconclusive partly because no complete laboratory data were available at that time, and because the first study included paralytic cases later found to be caused by some virus other than polio. The new study shows that polio among GG-inoculated patients represented only 19 per cent of the whole group of inoculated and noninoculated cases. Previously the percentage appeared to be over 25.

"Several changes can be noted," they said. "Some protection during the first week (latter part of the incubation period) now appears more probable; protection during the next four weeks, highly significant before, is even greater; and protection in the period six through eight weeks after injection . . . also appears greater."

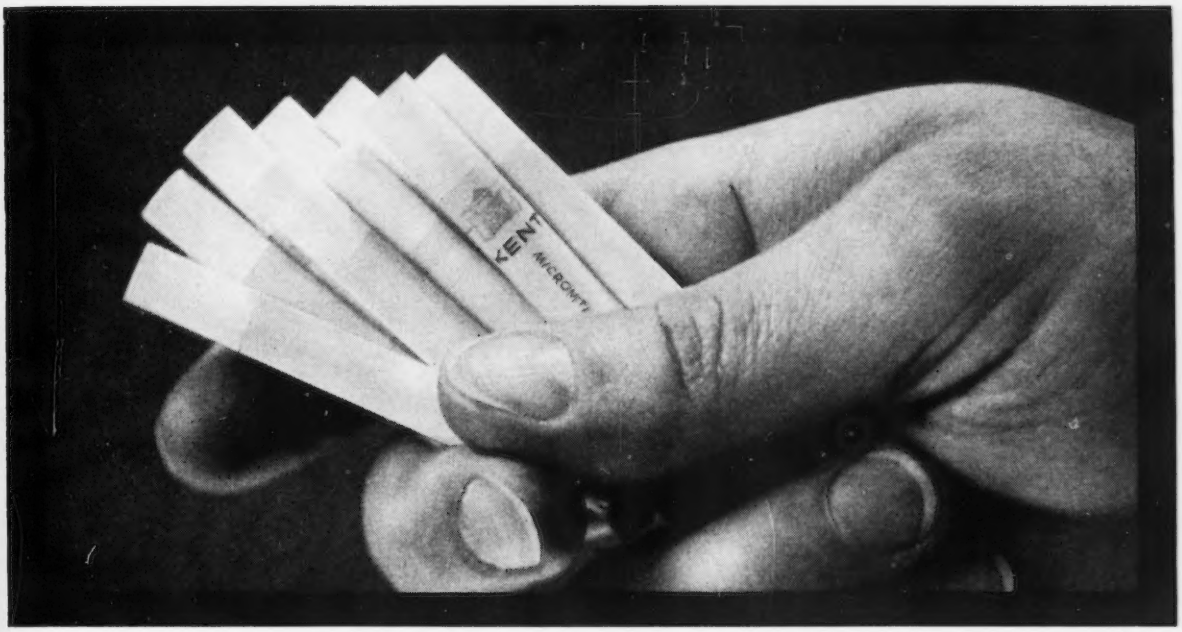
Grading the severity of paralysis in the laboratory-confirmed cases of polio showed that "cases occurring during the first through the sixth week after inoculation were milder among those given gamma globulin than among those given gelatin. The difference observed for this period of time is significant," they said. If GG given in the late period of incubation fails to prevent polio, it may modify it. Confirmation of these findings in tests on a larger group would indicate that GG cut the incidence of residual paralysis by 61 per cent among those patients injected in the last week of incubation.

"The application of this information to use in family contact groups is obvious," Dr. Hammon and his associates said. "Many statements have been quoted from authoritative sources by the lay press and have appeared repeatedly . . . to the effect that gamma globulin offers no protection if given after infection.

"The more accurate data based only on laboratory-confirmed cases lend support to the hypothesis that antibody given during the incubation period

(Continued on Page 82)

Why is it, Doctor, that one filter cigarette gives so much more protection than any other?



The answer is simply this: Among today's nine brands of filter cigarettes, KENT, and KENT alone, has the *Micronite Filter*... made of a pure, dust-free material that is so safe, so effective it has been selected to help filter the air in hospital operating rooms.

> In continuing and repeated impartial scientific tests, KENT's Micronite Filter consistently proves that it takes out *more* nicotine and tars than *any* other filter cigarette, old or new.

And yet, with all its superior protection, KENT's Micronite Filter lets smokers enjoy the full, satisfying flavor of fine, mellow tobaccos.

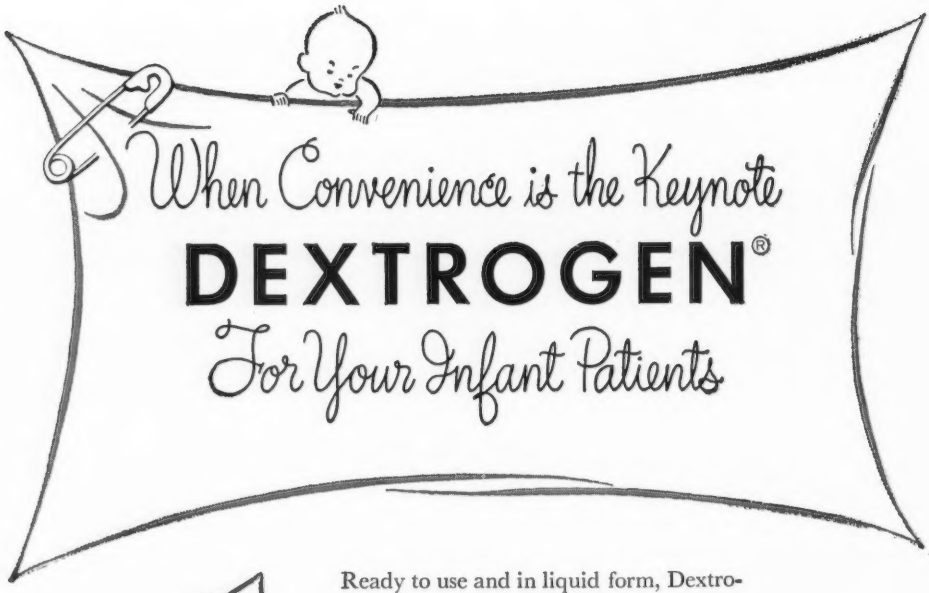
For these reasons, Doctor, shouldn't KENT be the choice of those who want the minimum of nicotine and tars in their cigarette smoke?

Kent

... the only cigarette with the MICRONITE FILTER

for the greatest protection in cigarette history

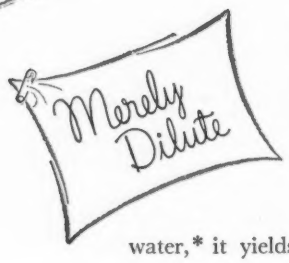
"KENT" AND "MICRONITE" ARE REGISTERED TRADEMARKS OF P. LORILLARD COMPANY



When Convenience is the Keynote

DEXTROGEN®

For Your Infant Patients



Ready to use and in liquid form, Dextrogen is a concentrated infant formula, made from whole milk modified with dextrins, maltose, and dextrose. In addition, it is fortified with iron to compensate for the deficiency of this mineral in milk. Diluted with 1½ parts of boiled water,* it yields a mixture containing proteins, fats and carbohydrates in proportions eminently suited to infant feeding. In this dilution it supplies 20 calories per ounce.

The higher protein content of normally diluted Dextrogen—2.2% instead of 1.5% as found in mother's milk—satisfies every known protein need of the rapidly growing infant. Its lower fat content makes for better tolerability and improved digestibility.

Dextrogen serves well whenever artificial feeding is indicated, and is particularly valuable when convenience in formula preparation is desirable.

*Applicable third week and thereafter; 1:3 for first week, 1:2 for second week.

NOTE HOW SIMPLE TO PREPARE

All the mother need do is pour the contents of the Dextrogen can into a properly cleaned quart milk bottle, and fill with previously boiled water. Makes 32 oz. of formula, ready to feed.*

THE NESTLÉ COMPANY, INC.

Professional Products Division

WHITE PLAINS, NEW YORK

'For many years the natives of the Dutch Indies have used the squeezed juice of the Curcuma in the treatment of diseases of the liver'

Gallogen

Gallogen (gal-o-jen) is the Massengill name for the synthesized active principle of the ancient drug Curcuma. The isolation and synthesis of the active principle permits the administration of a pure, standardized form of the drug. Gallogen is a true choleretic, not a bile salt.

Gallogen acts directly on the hepatic cells. It stimulates the flow of bile which is whole in volume and composition. The choleresis is in proportion to the functional capacity of the liver and is prompt and lasting.

Gallogen is indicated whenever it is desirable to increase the flow of bile, encourage activity of the gallbladder and promote normal function of the biliary system.

send for professional literature and sample

Like other choleretics, PTMC should not be used in the presence of acute biliary conditions, in common duct obstructions, hepatitis or marked cholangitis; it should be avoided when marked cicatrication or organic narrowing of the duct is suspected.

Supply: in bottles of 100 and 1000 tablets containing 75 mg. of the diethanolamine salt of the mono-d-camphoric acid ester of p-tolylmethyl carbinol.

THE S. E. MASSENGILL COMPANY, Bristol, Tennessee

Alien Physicians Fill Hospital Vacancies

A large increase in alien physicians taking postgraduate work in the United States has helped fill gaps left by many young doctors now on active military duty, a survey has shown.

The number of aliens on U. S. hospital staffs more than doubled from 1950-51 to 1953-54, the survey showed in a recent issue of the *Journal of the American Medical Association.*

During the 1953-54 school year, 5,589 foreign physicians held appointments as interns, residents, or fellows on house staffs of the 800 civilian hospitals approved for such training by the Department of State. Three years before the total was 2,072.

These aliens cut the number of vacancies in those hospitals down to 20 per cent for residents and 30 per cent for interns. Without them the percentage would have been considerably greater, since "many young physicians who would normally be taking postgraduate work are on active military duty." Aliens made up 22 per cent of the total house staffs in the approved hospitals. Most of them were located in general hospitals which do not serve as major teaching hospitals for medical schools. They made up almost half the staffs of tuberculosis hospitals approved for alien training, and about one-fourth of the staffs of mental hospitals, but only about one-tenth of the teaching hospital staffs.

Three states—Mississippi, North Dakota and Arkansas—had no alien physicians in training. Largely because of state licensing laws, more than two-thirds of them were in five states—New York, Ohio, New Jersey, Illinois, and Massachusetts. In New Jersey, 65 per cent of the house staff positions were filled by aliens, and in New York, Illinois, and Ohio, about 30 per cent.

The postgraduate alien training program began in mid-1949 under the U. S. Information and Educational Exchange Act of 1948. The report in the *Journal* was made by Harold S. Diehl, M.D., Minneapolis; Edwin L. Crosby, M.D., Chicago, and Paul K. Kaetzel, B.A., Washington, of the Health Resources Advisory Committee of the Office of Defense Mobilization.

New

For ESSENTIAL HYPERTENSION

an alliance of the classic and contemporary . . .

THEOMINAL® R.S.

(Theominal with Rauwolfia serpentina)

Combines for synergistic action:

Theobromine	*(5 grains) 0.32 Gm.*
Luminal® (pioneer brand of phenobarbital)	*(1/6 grain) 10 mg.*
Rauwolfia serpentina alkaloids (alseroxylon fraction)	***1.5 mg.***

Theominal itself has been widely prescribed for essential hypertension for several decades. The addition of Rauwolfia serpentina alkaloids—purified alseroxylon fraction—to the well established Theominal formula represents a substantial improvement.

With the use of Theominal R.S., objective and subjective improvement can be obtained in a large percentage of hypertensive patients. There is mild and gradual but sustained reduction of excessive blood pressure and pulse rate to near normal levels. Striking symptomatic improvement occurs concurrently: alleviation of congestive headache, vertigo, dyspnea, nervous irritability, apprehension and insomnia.

With Theominal R.S. medication the antihypertensive action of Luminal and theobromine may be evident in a few days, whereas a week or more may elapse before the Rauwolfia component exhibits its maximum effectiveness. However, the sense of well being due to Rauwolfia is experienced within a few days of medication and usually precedes the development of the maximum antihypertensive effect. Theominal R.S. is well tolerated.

DOSAGE: The usual dose of Theominal R.S. is 1 tablet two or three times daily. When improvement has been maintained for a time, the dose may be reduced or medication suspended occasionally until its resumption is indicated.

HOW SUPPLIED: Theominal R.S. is supplied in bottles of 100 tablets.

WINTHROP

Winthrop-Stearns INC.
NEW YORK 18, N. Y. WINDSOR, ONT.

Theominal and Luminal, trademarks reg. U. S. Pat. Off.

California MEDICINE

CLASSIFIED ADVERTISEMENTS

Rates for these insertions are $5 for fifty words or less; additional words 6 cents each

Copy for classified advertisements should be received not later than the tenth of the month preceding issue. • Classified advertisers using Box Numbers forbid the disclosure of their identity. Your inquiries in writing will be forwarded to Box Number advertisers.

PHYSICIANS WANTED

CALIFORNIA LICENSED PHYSICIAN SURGEONS WANTED: Contact us for registration forms and information on our many excellent opportunities in California. Outstanding openings in General Practice, Industrial and the Specialties . . . associations, assistantships, groups, locations for private practice in Northern, Central and Southern California. Pacific Coast Medical Bureau Agy., 703 Market Street, San Francisco, or 510 West Sixth Street, Los Angeles.

WANTED—Young orthopedic surgeon either board certifiied or eligible, California license, for association with orthopedic office in Beverly Hills, California. Box 90,985, California Medicine.

MANY EXCELLENT OPPORTUNITIES in all SPECIALTIES and GENERAL PRACTICE throughout the WEST. Salaries, percentage, partnerships, groups. For information please contact Norma Rohl, THE MEDICAL CENTER AGENCY, 26 O'Farrell Street, San Francisco, YUkon 2-3412.

CLASSIFIED ADS ARE PAYABLE IN ADVANCE

PHYSICIANS-SURGEONS WANTED. Write us for forms if interested in locating in Pacific Northwest, Southwest, or through the Rocky Mountain area. No registration fee; strictly confidential. CONTINENTAL MEDICAL BUREAU (Helen Buchan), 510 West Sixth Street, Los Angeles 14, California.

SITUATIONS WANTED

GENERAL PRACTITIONER, 34, family. Eastern training. Practice in California two years. Desires association with a group or General Practitioner. Prefer coastal city near San Francisco. Immediate response requested. Box 90,990, California Medicine.

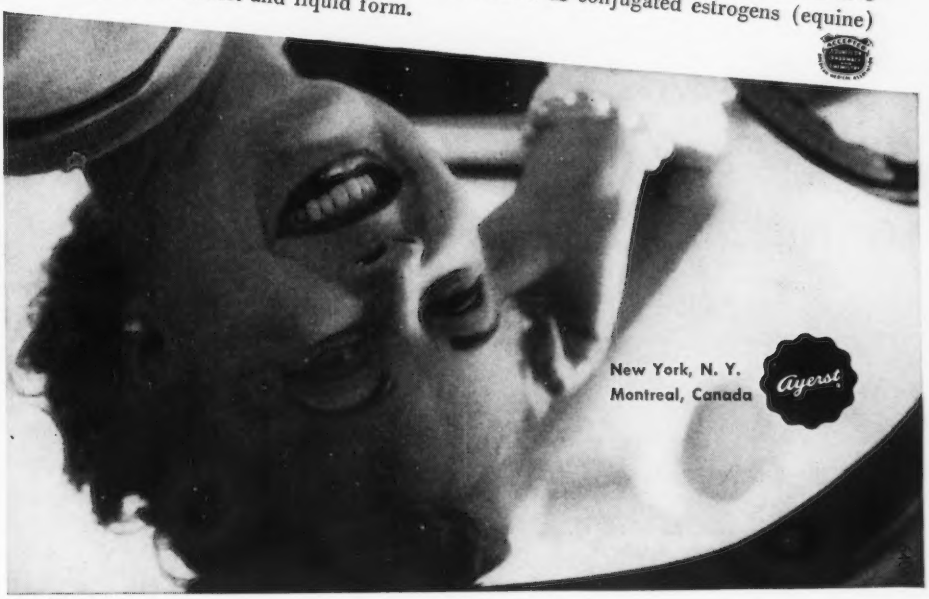
RADIOLOGIST desires location in group, office or hospital practice, or combination. Twelve years in large University hospital and medical school; professorial rank. California license, Board publications, etc. World War II veteran, age 41; family; can invest. Will be in California at meetings early December. Box 90,980, California Medicine.

BOARD ELIGIBLE SURGEON desires association with Board Surgeon in Private or Clinic practice. Available January 1955. Now finishing 4-year General Surgery residency. EXPERIENCE: Year private surgical practice; chief surgeon in small hospital during Korean War as drafted M.D. Married, wife and three children. Box 90,975, California Medicine.

GENERAL SURGEON—Board certified; 36, married. Completing active duty in Navy November 17th. Five years' private practice, some thoracic experience. Desires partnership or association with a group or established surgeon. Licensed in California. Box 90,970, California Medicine.

(Continued on Page 96)

For every patient who presents such obvious menopausal symptoms as **hot flushes,** there will be another with symptoms equally distressing but not so clearly defined; **arthralgia** as well as insomnia, headache, easy fatigability, are good examples. Frequently these symptoms are due to declining ovarian function but are not so recognized because they may occur long before, or even years after, menstruation ceases. In such cases, the patient should have the **benefit** of estrogen therapy. **"Premarin"** (complete natural equine estrogen-complex) not only produces prompt symptomatic relief but also imparts a gratifying and distinctive **"sense of well-being."** Has no odor . . . imparts no odor. "Premarin"® is supplied in tablet and liquid form.



Gamma Globulin Shown More Effective

(Continued from Page 72)

has a beneficial effect that can be interpreted either as modification or prevention."

Cooperating in the report were Lewis L. Coriell, M.D., Camden, N. J.; Ernest H. Ludwig, Ph.D., Pittsburgh; Robert M. McAllister, M.D., Camden; Arthur E. Greene, Ph.D., Philadelphia; Gladys E. Sather, M.P.H., Pittsburgh, and Paul F. Wehrle, M.D., Baltimore.

A preliminary report on part of the reanalysis was presented at the 103rd annual meeting of the A.M.A. on June 24, 1954, in San Francisco.

Problem Drinker Should be Helped While at Work

(Continued from Page 67)

advised he is being turned over to the medical division. At the end of three months the division recommends either that he is trying and should be retained, or that he shows no interest in rehabilitation and should be discharged.

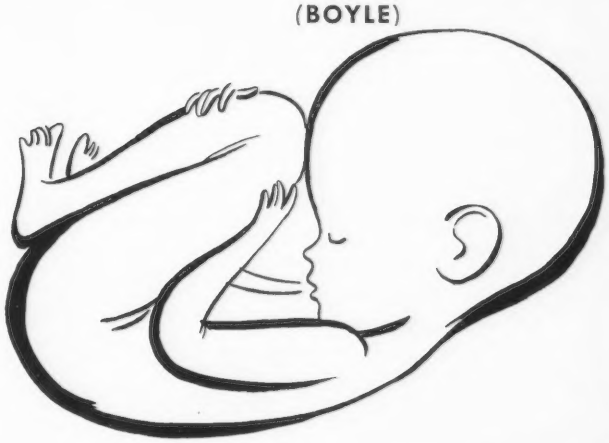
The company cooperates closely with Alcoholics Anonymous, and has a "companywide alert" to the problem and its treatment. "The fact that alcoholism or problem drinking is accepted as a disease by a company so scientific as du Pont and treated as any other illness by our medical division has opened the way for the rehabilitation of hundreds of employees," Dr. Hogshead said.

the NEW prenatal conforming to the NEW concept...

phosphorus-free

OBNATAL

(BOYLE)



Suggested daily dose of 1 capsule-shaped tablet t.i.d. supplies:

Calcium Lactate USP	2.25 Gm.
Ferrous Sulfate USP *(Iron content 60 mg.)*	300.0 mg.
Vitamin C	100.0 mg.
Vitamin B_6	10.0 mg.
Vitamin B_{12}	10.0 mcg.
Vitamin B_1	4.0 mg.
Vitamin B_2	2.5 mg.
Niacinamide	60.0 mg.
Folic Acid	0.3 mg.
Calcium Pantothenate	5.0 mg.
Vitamin K	1.5 mg.
Vitamin A *(acetate)*	6,000 USP units
Vitamin D	600 USP units
Iodine	0.15 mg.
Copper	1.0 mg.
Magnesium	15.0 mg.
Cobalt	0.15 mg.
Manganese	4.5 mg.
Molybdenum	0.15 mg.
Nickel	0.15 mg.
Zinc	2.25 mg.

Available at all pharmacies in bottles of 100 and 1000 tablets

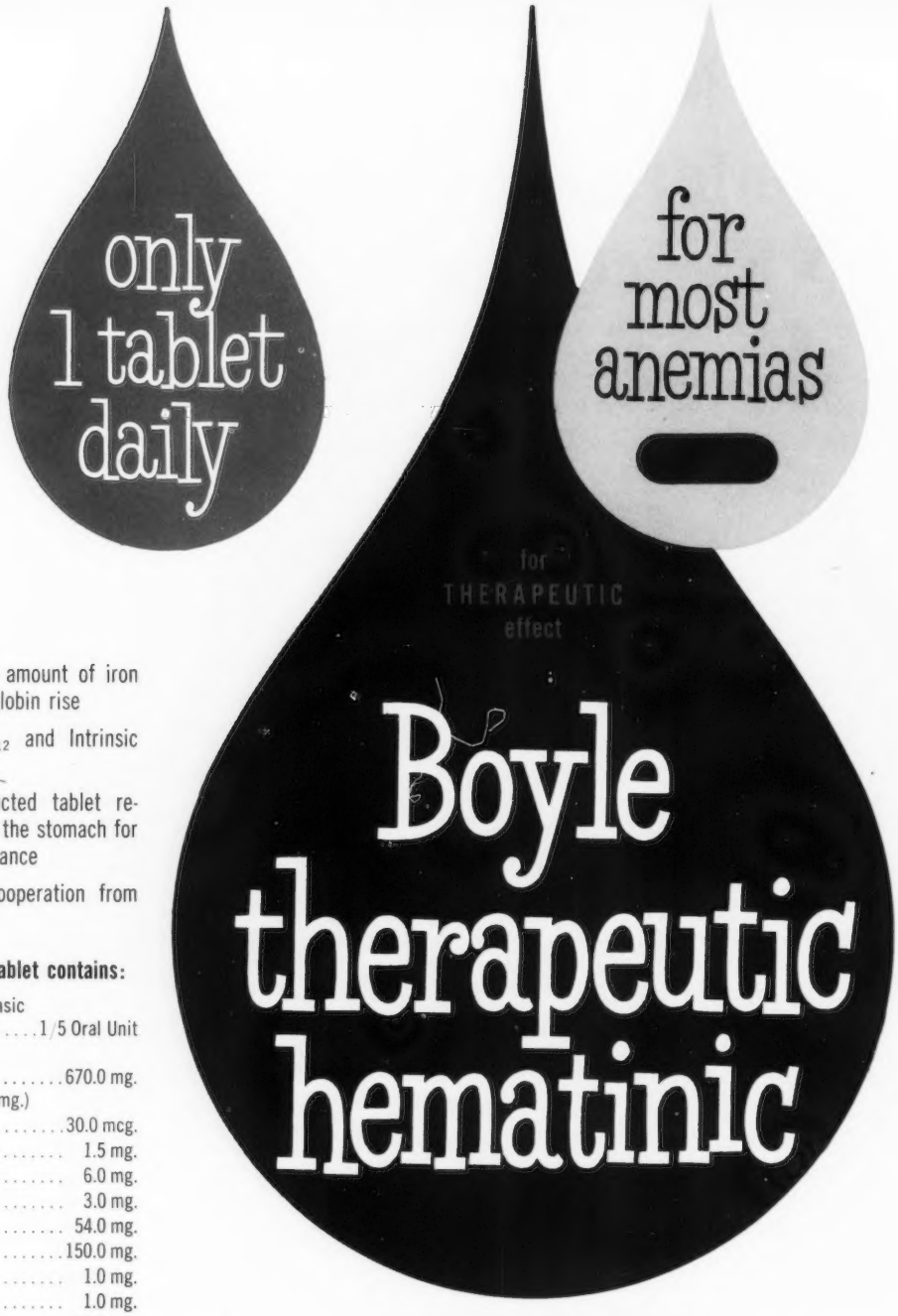
At last... a phosphorus-free prenatal that provides in 1 easy-to-swallow tablet t.i.d.:

- ***Readily assimilable soluble calcium from calcium lactate USP***
- ***60 mg. available iron, well tolerated through slow disintegration in the stomach***
- ***Vitamins and other minerals in amounts exceeding minimum daily requirements for pregnancy***
- ***High potency Vitamin B_6 plus supportive vitamins and trace minerals***

BOYLE & COMPANY

BOYLE

LOS ANGELES 33 CALIFORNIA



★ Truly therapeutic amount of iron assures rapid hemoglobin rise

★ Fortified with B_{12} and Intrinsic Factor U.S.P.

★ Specially constructed tablet releases iron slowly in the stomach for greater patient tolerance

★ Better patient cooperation from 1-tablet daily dose

1 capsule-shaped tablet contains:

Vitamin B_{12} with *Intrinsic Factor U. S. P.	1/5 Oral Unit
Ferrous Sulfate Dried (10.4 Gr.) (Iron content...200 mg.)	670.0 mg.
†Vitamin B_{12}	30.0 mcg.
Folic Acid	1.5 mg.
Vitamin B_1	6.0 mg.
Vitamin B_2	3.0 mg.
Niacinamide	54.0 mg.
Vitamin C	150.0 mg.
Copper	1.0 mg.
Cobalt	1.0 mg.
Liver Desiccated N. F.	75.0 mg.

**Potency established prior to mixture with other ingredients.*

†Vitamin B_{12} derived from Streptomyces fermentation extractives.

New low cost package:
Bottles of 30 for 1 month supply available at all pharmacies

BOYLE

BOYLE & COMPANY • LOS ANGELES 33, CALIFORNIA

ALSO AVAILABLE • BOYLE HEMATINIC WITH B_{12} • BOYLE HEMATINIC

"Parrot Fever" Can Come from Chickens

"Parrot fever," commonly believed to be a rare disease caught only from parrots and parakeets, probably is not so rare and even can come from chickens, turkeys, and ducks.

Thirty-seven cases of psittacosis probably caught from chickens were found during six months in the rural area around Warren, in northwestern Illinois. The cases were reported in a recent issue of the *Journal of the American Medical Association.*

Investigation of possible sources of the disease showed chickens to be "the only potential reservoir commonly associated with these cases." Not all resulted from direct contact with chickens. One patient had cleaned a chicken yard two weeks before his illness; another had an apparently well parakeet; another had an apparently well canary.

Besides a severe cough—the chief complaint—the patients had chest pain, fever, headaches, muscular aches and pains, backaches, and weakness or fatigue. None died. "It would certainly appear from our experience that in any case of virus pneumonia or chronic cough occurring in persons in rural areas, the possibility of psittacosis infection should be considered," the writers said.

The report was made by Drs. C. George Ward, Warren, Ill., Albert L. Hildinger, Galena, Ill., Jackson P. Birge, Rock Island, Ill., and public health official Richard A. Morrissey, Chicago.

Note the Nutritional Difference

THE superior nutritive value of enriched bread over unenriched bread is emphasized by analytical data recently published by the United States Department of Agriculture.[1] Comparison of the two kinds of bread indicates how much more effectively enriched bread contributes to nutritional needs.

Since enriched breads represent an estimated 85 per cent of all commercially produced bread, the evidence shows that bread enrichment has notably increased the B vitamin and iron intake of our population. For this reason enriched bread, since 1941 (when it was first marketed), has been a valuable aid in reducing the incidence of attributable deficiency diseases.[3,4]

But enriched bread contributes to good nutrition in other ways, too. The 13 grams of protein supplied by 5½ ounces (estimated average daily consumption) aids notably in the satisfaction of the daily protein requirement. Since virtually all enriched bread today contains substantial amounts of nonfat milk solids, its protein —consisting of flour and milk proteins—is biologically effective for growth as well as tissue maintenance.

Because of its high nutrient value, its easy and almost complete digestibility, and its universally accepted pleasant, bland taste, enriched bread merits a prominent place not only in the general diet, but in special diets as well. In many reducing diets 3 or more slices daily are included. The average slice of machine-sliced enriched bread supplies only 63 calories.

At notably low cost, enriched bread is making a valuable contribution to the nutritional health of the American people.

1. Watt, B.K., and Merrill, A.L.: Composition of Foods—Raw, Processed, Prepared, United States Department of Agriculture, Agricultural Handbook no. 8, 1950.
2. Data furnished by the Laboratories of The American Institute of Baking, Chicago, Illinois.
3. Sebrell, W.H., Jr.: Trends and Needs in Nutrition, J.A.M.A. *152*:42 (May 2) 1953.
4. Flour and Bread Enrichment, 1949-50, The Committee on Cereals, Food and Nutrition Board, National Research Council, 1950.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

B VITAMIN AND IRON CONTRIBUTION OF 5½ OUNCES* OF ENRICHED AND UNENRICHED BREADS AND PERCENTAGES OF RECOMMENDED DAILY ALLOWANCES**

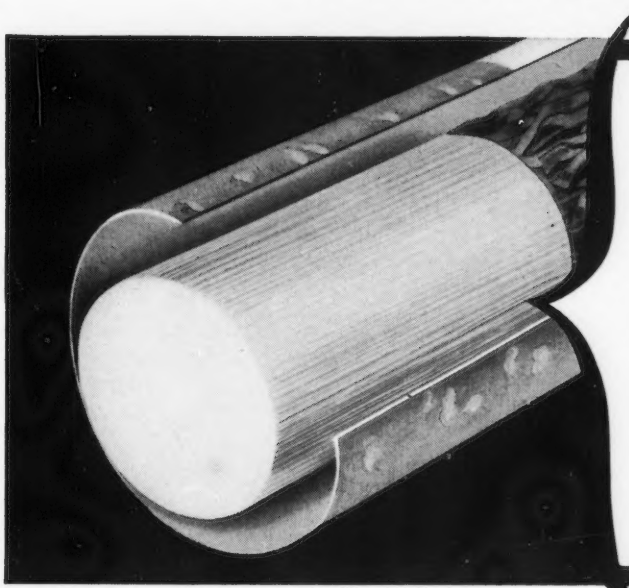
	ENRICHED BREAD		UNENRICHED BREAD (of former years)	
	Amounts	Percentages of Recommended Daily Allowances	Amounts	Percentages of Recommended Daily Allowances
THIAMINE	0.37 mg.	25%	0.08 mg.	5%
NIACIN	3.40 mg.	23%	1.40 mg.	9%
RIBOFLAVIN	0.23 mg.	14%	0.09 mg.	6%
IRON	4.10 mg.	34%	1.10 mg.	9%

*An estimated amount of bread consumed daily by the average person.
**Daily dietary allowances (1953) recommended by the National Research Council for a fairly active man 45 years of age, 67 inches in height, and weighing 143 pounds.

AMERICAN BAKERS ASSOCIATION 20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

DOCTOR, WHEN YOUR PATIENTS ASK...

What have VICEROYS got that other filter tip cigarettes haven't got?



The Answer Is

20,000 FILTERS

in Every Viceroy Tip

Only Viceroy has this new-type filter. Made of a non-mineral cellulose acetate—it gives the greatest filtering action possible without impairing flavor or impeding the flow of smoke.

Smoke is also filtered through Viceroy's king-size length of rich, costly tobaccos. Thus, Viceroy smokers get *double the filtering action* . . . for only a penny or two more than brands without filters.

WORLD'S LARGEST-SELLING FILTER TIP CIGARETTE

New King-Size

Filter Tip VICEROY

ONLY A PENNY OR TWO MORE
THAN CIGARETTES WITHOUT FILTERS

NOW the safest agent yet developed for decisive control of BLOOD PRESSURE with 5 important firsts

UNITENS

brand of cryptenamine

Unitensen is recommended for the patient who needs more than tranquilizing effects. It produces positive, sustained falls in blood pressure.

This is what Unitensen Tablets do . . . and with unparalleled safety

These patients experienced sustained control of blood pressure levels over prolonged periods of time.

Summary of Case Histories-Series A*

Age—Sex	BP—mm. Hg. BEFORE	BP—mm. Hg. AFTER
64—M	190/115	140/90
37—M	200/130	130/85
48—M	230/140	140/100
46—M	220/140	160/110
41—M	210/140	155/110
43—M	200/120	160/110
26—M	230/130	180/120
44—M	220/130	175/120
46—M	220/120	162/90

(Write for complete clinical data, including case histories.)

*Personal communication to Irwin, Neisler & Company.

FIRST IN MAINTAINING DECISIVE BLOOD PRESSURE CONTROL

The sole therapeutic agent in Unitensen Tablets is cryptenamine—a potent blood pressure lowering alkaloid fraction isolated by the research staff of Irwin, Neisler & Company. In the majority of cases (see chart at left), cryptenamine will lower blood pressure decisively, and will control blood pressure at the lower levels for prolonged periods of time.

FIRST IN SAFETY

Unitensen Tablets exert a central action on the blood pressure lowering mechanism. Circulatory equilibrium is not disrupted. Improved circulation and improved work of the heart are often attained, *along with the decisive fall in blood pressure.*

Unitensen Tablets have no sympatholytic or parasympatholytic action. Ganglionic blocking does not occur. Unitensen Tablets *do not* cause postural hypotension and collapse, an ever-present risk with other potent blood pressure lowering drugs. Renal function is *not* impaired.

EN®

TANNATE TABLETS

Bottles of 50, 100, 500 and 1000.

FIRST WITH DUAL ASSAY

Unitensen is biologically standardized twice, first for hypotensive response and, second, for side effects (emesis) in the dog so that a safe therapeutic range between the two is assured. In extensive clinical trials only a few isolated cases exhibited occasional vomiting.

Unitensen Tablets do not cause the serious side effects common to widely used synthetic hypotensives. Unitensen Tablets can be given over long periods of time with entire dependability. Cumulative effects have not been noted.

FIRST IN SIMPLE DOSAGE

Start with 2 tablets daily, given immediately after breakfast and at bedtime. If more tablets are needed, include an afternoon dose at 1 or 2 p.m.

FIRST IN ECONOMY

Because of lower dosage, Unitensen Tablets save your patients ⅓ to ½ over the cost of other potent blood pressure lowering agents.

Each Unitensen Tablet contains: Cryptenamine* (as the tannate salt) ..... 2 mg.†

*Ester alkaloids of Veratrum viride obtained by an exclusive Irwin-Neisler nonaqueous extraction process.
†Equivalent to 260 Carotid Sinus Reflex Units.

IRWIN, NEISLER & COMPANY DECATUR, ILLINOIS

Protection of the clinically cured patient from re-infection with TRICHOMONAS VAGINALIS

Because of the general recognition of the male as a possible vector,[1-4] the post-treatment use of a condom during coitus is a valuable safeguard of success in the management of Trichomonas vaginitis.

The regular use of a condom by the husband of the clinically cured woman for a period of three months or more reduces the chance of recurrence of symptoms.[2] A condom also protects the male partner against possible infection from a quiescent residual focus in the woman.

The asymptomatic infection in the husband is often the basis for stubborn infection in the wife. The detection of Trichomonas vaginalis infection in the husband is a frequent by-product of the search for the source of recurrences in the woman.[3] After clinical cure of both sexual partners, the regular use of a condom during coitus for three months or longer effectively breaks the cycle of infection and re-infection.

Among admittedly promiscuous men, Trichomonas vaginalis infection often accompanies specific or nonspecific urethritis, and sometimes urethral stricture.[1,2] The usual mildness and self-limiting nature of the infection in the male makes its eradication much easier than in the female.[4] After apparent cure, the use of a condom during intercourse for 30 days prevents possible infection of the female sexual partner.

The need for the protection of a condom during coitus should be impressed upon the woman patient. The greater distress and greater severity of symptoms among women, as well as their passive role during coitus combine to enforce adherence to the use of a condom by the male sexual partner.

Occasionally patients will manifest a reluctance to use the condom because of inconvenience or dulling of sensation. These objections are readily overcome following the recommendation and initial trial of pre-moistened, convenient FOUREX® skins. As these are prepared from the cecum of sheep, they do not exert any retarding effect on sensory nerve endings. In those cases where cost is a paramount factor, the use of RAMSES,® a transparent, very thin rubber condom, or SHEIK,® a popular-priced brand, will prove eminently satisfactory.

Physicians may now obtain a complimentary package of FOUREX pre-moistened skins and RAMSES and SHEIK rubber condoms to enable them to confirm their value among patients as adjuncts to the successful treatment of Trichomonas vaginitis. In order to limit distribution to physicians only, kindly request this complimentary package on your prescription blank and mail to: Dept. C3, **Julius Schmid, Inc., 423 West 55th Street, New York 19, N. Y.**

references:

1. Lanceley, F.: Brit. J. Ven. Dis. 29:213-217, Dec. 1953; abstracted J.A.M.A., 154:1467, Apr. 24, 1954. 2. Bernstine, J. B., and Rakoff, A. E.: Vaginal Infections, Infestations, and Discharges, New York, The Blakiston Company, Inc., 1953, pp. 256-259. 3. Kanter, A. E.: The Recognition and Treatment of Vaginal Lesions, Postgrad. Med. 12:457, Nov. 1952. 4. Meigs, J. V., and Sturgis, S. H.: Progress in Gynecology, vol. 2, New York, Grune and Stratton, Inc., 1950, p. 433.

"...BEST METHOD AVAILABLE..."

After giving 'Teldrin' *Spansule* capsules to 30 allergic patients over a 6 month period, Rogers[1] concluded:

"It is our belief that this drug in this form provides the best method available for using antihistamine medication."

'Teldrin' *Spansule* capsules are "the best method available" because they incorporate 3 distinct advantages:

1. They contain chlorprophenpyridamine maleate, the widely prescribed, well-tolerated antihistamine.
2. They release this drug slowly, continuously, and uninterruptedly over a period of 8-10 hours, with a therapeutic effect lasting approximately 12 hours. Side effects are thus held to a minimum.
3. They provide maximum dosage convenience.

TELDRIN*

chlorprophenpyridamine maleate

SPANSULE*

brand of sustained release capsules

S.K.F.'s widely acclaimed new

ANTIHISTAMINE

preparation

around-the-clock protection

Adults and Older Children: One capsule (12 mg.) q12h.
Younger Children: One capsule (8 mg.) q12h.

made only by

Smith, Kline & French Laboratories, Philadelphia 1
the originators of sustained release oral medication

1. Rogers, H. L.: Ann. Allergy 12:266 (May-June) 1954.
*T.M. Reg U.S. Pat. Off. Patent Applied For

"Cancer Cure" Found To Be Only Cough Medicine

The American Medical Association's Bureau of Investigation recently reported that the only "pharmacologically active" ingredient in the so-called Hoxsey "cancer tonic" is a drug used mainly in cough medicine.

The bureau observed in a recent issue of the *Journal of the American Medical Association* that it sees no reason for the A.M.A. to further investigate the remedy.

It points out that the federal government has obtained an injunction against shipment of the material in interstate commerce as a cancer medicine.

Any person with "a modicum of knowledge" of drugs knows that the medicine "is without any therapeutic merit in the treatment of cancer," the bureau said.

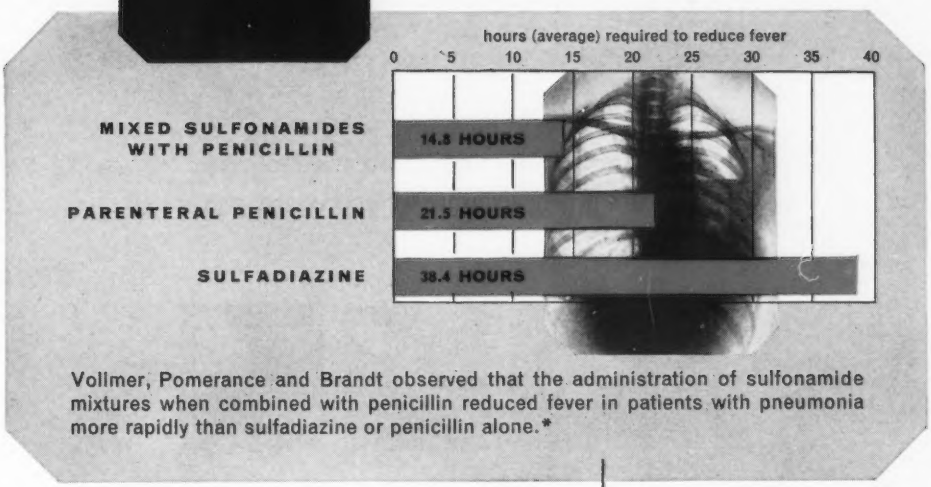
"Any such person who would seriously contend that scientific medicine is under any obligation to investigate such a mixture or its promoter is either stupid or dishonest.

"There is indication that certain persons, including a Pennsylvania state senator and several physicians, magazine editors, and newspaper editors, have sought to create in the minds of the public an idea that organized medicine, particularly the American Medical Association, will not give Mr. [Harry] Hoxsey an opportunity to demonstrate his claimed cancer cure before the world, because it refuses to send representatives to Dallas, Texas, to investigate.

"It is fair to observe that the American Medical Association or any other association or individual has no need to go beyond the Hoxsey label to be convinced," the bureau stated.

"Under the circumstances, the whole picture would be extremely ludicrous except for the appeal to the credulous and unreasoning, which can conceivably result in unnecessary injury, damage, and death to many persons, not from an overdose of the Hoxsey tonic, but by reason of their relying on it instead of on proper, established procedures until their condition has progressed so far that they cannot be cured."

combined action means faster patient recovery



Vollmer, Pomerance and Brandt observed that the administration of sulfonamide mixtures when combined with penicillin reduced fever in patients with pneumonia more rapidly than sulfadiazine or penicillin alone.*

the preferred quadri-sulfa mixture...

DELTAMIDE® *w*/penicillin

combines 4 of the most useful sulfonamides with penicillin for—

a wider antibacterial spectrum

the advantages of a sulfonamide combination: faster therapeutic blood levels and better sustained; higher solubility in the urine; greatly reduced renal toxicity and lessened side-effects.

the true potentiation of action that occurs with the use of sulfonamide mixtures

the truly synergistic action that occurs when sulfonamides and penicillin are combined

*Vollmer, H.; Pomerance, H. H., and Brandt, I. K.: New York State J. Med. 50: 2293, 1950.

Each tablet or teaspoonful of the pleasant-tasting **chocolate-flavored** suspension contains:

DELTAMIDE	DELTAMIDE *w*/penicillin
0.167 Gm. sulfadiazine	0.167 Gm.
0.167 Gm. sulfamerazine	0.167 Gm.
0.056 Gm. sulfamethazine	0.056 Gm.
0.111 Gm. sulfacetamide	0.111 Gm.
— penicillin G	250,000 Units

Deltamide

Tablets: Bottles of 100 and 1000.

Suspension: Bottles of 4 and 16 oz.

Deltamide *w*/penicillin

Tablets: Bottles of 36 and 100.

Powder for Suspension: 60 cc. bottles to provide 2 oz. of suspension by the addition of 40 cc. of water.

also available **DELTAMIDE**

THE ARMOUR LABORATORIES
A DIVISION OF ARMOUR AND COMPANY · CHICAGO 11, ILLINOIS

accuracy every time

Clinitest®

BRAND

for detection of urine-sugar

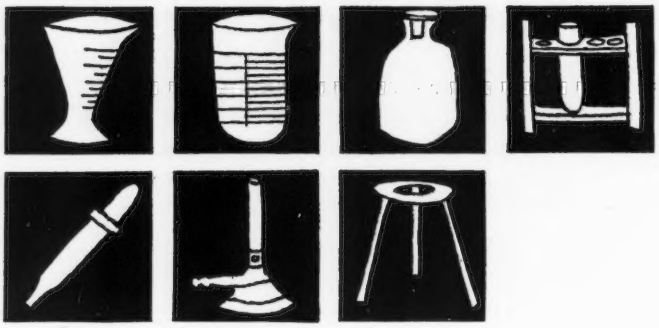
"Both *Clinitest* and Benedict's qualitative test are completely accurate when properly performed."[1]

but

"...there are fewer sources of error with *Clinitest*."[1]

and

"The routine Benedict test...is seldom well performed because of the difficulties of accurate measurement of reagent and urine and because of the practical difficulties of uniform heating; the much simpler and more readily standardized tablet test is to be preferred..."[2]



1. Cook, M. H.; Free, A. H., and Giordano, A. S.: Am. J. M. Technol. *19*:283, 1953.
2. Gray, C. H., and Millar, H. R.: Brit. M. J. *4824*:1361 (June 20) 1953.

Ames Diagnostics–Adjuncts in clinical management

AMES

COMPANY, INC • ELKHART, INDIANA

Ames Company of Canada, Ltd., Toronto

53256

KARO SYRUP

BELONGS IN THIS PICTURE!

. . . a carbohydrate of choice
in milk modification for 3 generations

OPTIMUM caloric balance—60% of caloric intake, gradually achieved in easily assimilable carbohydrates—is assured with Karo. Milk alone provides 28%, or less than half the required carbohydrate intake.

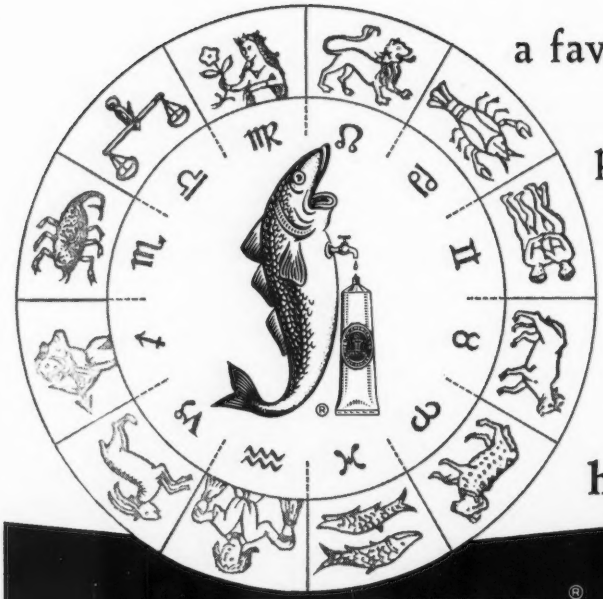
A MISCIBLE liquid, Karo is quickly dissolved, easy to use, readily available and inexpensive.

A BALANCED mixture of dextrins, maltose and dextrose, Karo is well tolerated, easily digested, gradually absorbed at spaced intervals and completely utilized.

PRECLUDES fermentation and irritation. Produces no reactions, hypoallergenic. Bacteria-free Karo is safe for feeding prematures, newborns, and infants—well and sick.

LIGHT and dark Karo are interchangeable in formulas; both yield 60 calories per tablespoon.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.



a favorite

prescription

the year 'round

to **accelerate**

healing

DESITIN® ointment

the pioneer external **cod liver oil** therapy

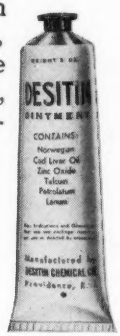
New impressive studies[1] again confirm the clinical value[2-4] of Desitin Ointment to protect, soothe, facilitate healthy granulation, and speed healing even in stubborn skin conditions often resistant to other therapy.

in **wounds • burns • ulcers** (decubitus, varicose, diabetic)

diaper rash • intertrigo

non-specific dermatoses • perianal dermatitis

Protective, soothing, healing, Desitin Ointment is a non-irritating, non-sensitizing blend of high grade Norwegian cod liver oil (with its unsaturated fatty acids and high potency vitamins A and D in proper ratio for maximum efficacy), zinc oxide, talcum, petrolatum, and lanolin. Desitin Ointment does not liquefy at body temperature and is not decomposed or washed away by secretions, exudate, urine or excrements. Dressings easily applied and painlessly removed. Tubes of 1 oz., 2 oz., 4 oz., and 1 lb. jars.



samples and reprint[1] on request

DESITIN CHEMICAL COMPANY
70 Ship Street, Providence 2, R. I.

1. Grayzel, H. G., Heimer, C. B., and Grayzel, R. W.: New York St. J. M. 53:2233, 1953.
2. Heimer, C. B., Grayzel, H. G., and Kramer, B.: Archives of Pediatrics 68:382, 1951.
3. Behrman, H. T., Combes, F. C., Bobroff, A., and Leviticus, R.: Ind. Med. & Surgery 18:512, 1949.
4. Turell, R.: New York St. J. M. 50:2282, 1950.

CLASSIFIED ADVERTISING

(Continued from Page 79)

NURSES WANTED

PUBLIC HEALTH STAFF NURSES for generalized program in County Health Department, north San Joaquin Valley, California. Five day, forty hour week, salary $318 to $385 at fifth year. Car furnished. Vacation, sick leave, retirement and hospital insurance in effect. Certificate in Public Health Nursing and California driver's license required. For further information write George F. O'Brien, M.D., County Health Office, P. O. Box 1607, Modesto, California.

ASSOCIATE WANTED

LONG-ESTABLISHED RADIOLOGIST in rapidly growing major Central California city desires an associate of good personality, and of above average ability. Send photograph and usual personal data. Please indicate amount and place of experience in x-ray diagnosis, x-ray and radium therapy, and with isotopes. Box 90,965, California Medicine.

OFFICES FOR RENT OR LEASE

FOR RENT—LOCATIONS FOR SPECIALISTS in growing community in centrally located Medical Building in suburban metropolitan area of Oakland, California. Excellent opportunity for dermatologist, ophthalmologist, E.N.T., internal specialists. Suites have always been occupied by above prosperous specialists. Free parking. Reasonable rents. Available December 1, San Leandro Medical Building Co., 1556 Leonard Drive, San Leandro, California.

LOCATION in family neighborhood for general practice. Store 20x60 divided into reception room, four treatment rooms, laboratory, etc. Temple City area, near Los Angeles. No competition, easy rent, write owner: H. K., 16780 Oak View Drive, Encino, California, for information.

SANTA MONICA—FOR LEASE—Large double unit in 4-unit Medical Dental Building, available soon. Excellent location for physician or specialist. Moderate rent, or will sell building on low down payment and easy terms. Mark J. Noy, D.D.S., 1123 Montana Avenue, Santa Monica, California. Telephone: EXbrook 5-1205.

JUST COMPLETING MEDICAL SUITE AND DENTAL SUITE—Approximately 800 square feet and 500 square feet respectively. Good location. Completely air conditioned. Large off-street parking area. For details contact: Tod Campbell, 514 Scenic Drive, Modesto, California. Telephone 3-2721.

FOR LEASE: Deluxe Suites in new modern medical building in Redwood City. Ample off-street parking. Available immediately. Box 90,890, California Medicine.

APPARATUS FOR SALE

FOR SALE: 30 M.A. FISCHER X-RAY Model TC, 220 or 100 Volts. Electro-Synchrotimer. 14 x 17 Grid. New Box. Cassettes and film holders. New condition. Cost $1,250.00. Sell $750.00. Terms. Cameron Electrocautery with Bipolar Coagulation and extras. Cost $160.00. Sell $75.00. M. G. Weitz, M.D., 1687 Trestle Glen Road, Oakland 10, California. Telephone: TWinoaks 3-7528.

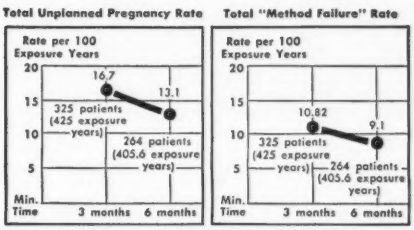
PLEASE DO NOT ASK for the names of classified advertisers in **California Medicine** who use box numbers. It is our agreement with these advertisers that the information will not be released. Address your replies or inquiries to the box number given, care of **California Medicine, Room 2000, 450 Sutter St., San Francisco 8,** and they will be forwarded promptly.

PSYCHOLOGIC MOTIVATION AND CONCEPTION CONTROL

Psychologic motivation, defined as "... the sincere, urgent, uncomplicated desire to remain nonpregnant..." is an increasingly recognized factor in the success or failure of contraceptive measures.[1]

One of the factors influencing motivation, namely, parity, was appraised by Guttmacher[1] and associates in a three-year study of the jelly-alone [RAMSES® VAGINAL JELLY] method for contraception. A carefully selected group of 325 postpartum clinic patients used RAMSES VAGINAL JELLY for periods representing a total of 425 patient years of exposure. The technic showed marked effectiveness but was especially successful "among patients of lower parity."

Although the method was highly dependable, some unplanned pregnancies did occur. The pregnancies were divided into "patient failures" and "method failures." Patients readily admitting omission or irregular use of the jelly were classified in the first group, while those claiming regular and faithful use of the jelly were grouped in the latter category.



Comparison of conception control with RAMSES VAGINAL JELLY in patients using the method for 3-36 months and 6-36 months.[1]

During 425 patient years of exposure in 325 women using the jelly, the total unplanned pregnancy rate was only 16.7 per 100 patient years of exposure. When the "method failure" for the entire group is calculated, the unplanned pregnancy rate drops to 10.82 per 100 patient years of exposure. When only those patients who used the jelly-alone technic for six months and longer are considered (the usual length of time accepted for valid comparisons) the pregnancy rate is decreased markedly. This indicates that familiarity with and reliance on the method are probably also important. In 264 such patients, during 405.6 patient years of exposure, the total unplanned pregnancy rate was only 13.1 per 100 years of exposure, and the method failure rate dropped to 9.1 per 100 years of exposure.

Fitting the method to the patient

It has been demonstrated that motivation, parity, and patient-intelligence play important roles in the selection and the successful use of a conception control method and, therefore, that the final decision regarding the selection of method must be left to the physician who is fully cognizant of all these points.

When in the judgment of the physician, parity, anatomic factors, or motivation indicates the use of the diaphragm-and-jelly method of contraception, the RAMSES® TUK-A-WAY® Kit is recommended. The RAMSES® diaphragm is flexible and cushioned — provides an optimum barrier and utmost comfort. In combination with RAMSES jelly it offers an unsurpassed contraceptive technic. Both products are **accepted by the appropriate Councils** of the American Medical Association.

*Active agent, dodecaethyleneglycol monolaurate 5%, in a base of long-lasting barrier effectiveness.

1. Finkelstein, R.; Guttmacher, A., and Goldberg, R.: Am. J. Obst. & Gynec. 63:664, Mar., 1952.

JULIUS SCHMID, INC. *gynecological division*
423 West 55th Street, New York 19, N.Y.

ON EVERY COUNT *Superior*

VITAMIN SUPPLEMENTS FOR INFANTS

Superior flavor Exceptionally pleasant "taste-tested" blend of flavors carefully protected during manufacture . . . no unpleasant aftertaste . . . readily accepted without coaxing.

Superior stability  Outstanding stability is achieved by Mead's specially developed solution. Poly-Vi-Sol and Tri-Vi-Sol do not require refrigeration . . . no expiration dates on labels . . . they may be safely autoclaved with the formula.

Superior convenience Light, free-flowing . . . no mixing necessary . . . calibrated droppers assure easy, accurate dosage. For infants, drop directly into the mouth. For children, measure into a spoon.

Superior hypoallergenicity  Poly-Vi-Sol® and Tri-Vi-Sol® supply crystalline vitamins in a completely hypoallergenic solution.

Poly-Vi-Sol

Six essential vitamins for drop dosage

Each 0.6 cc. supplies:

Vitamin A	5000 units
Vitamin D	1000 units
Ascorbic acid	50 mg.
Thiamine	1 mg.
Riboflavin	0.8 mg.
Niacinamide	6 mg.

Tri-Vi-Sol

Vitamins A, D and C for drop dosage

Each 0.6 cc. supplies:

Vitamin A	5000 units
Vitamin D	1000 units
Ascorbic acid	50 mg.

Available in 15 cc. and 50 cc. dropper bottles

MEAD JOHNSON & COMPANY • EVANSVILLE, INDIANA, U. S. A. MEAD

HERE'S HOW

POLYSAL®

HELPS YOUR PATIENTS

1

POLYSAL prevents and corrects hypopotassemia without danger of toxicity[1]

2

POLYSAL corrects moderate acidosis without inducing alkalosis[1]

3

POLYSAL replaces the electrolytes in extracellular fluid[1]

4

POLYSAL induces copious excretion of urine and salt[1]

Polysal, a *single* I.V. solution to build electrolyte balance, is recommended for electrolyte and fluid replacement in all medical, surgical and pediatric patients where saline or other electrolyte solutions would ordinarily be given. Available in distilled water—250 cc. and 1000 cc. and in 5% Dextrose—500 cc. and 1000 cc.

INSTEAD OF UNPHYSIOLOGICAL "PHYSIOLOGICAL SALINE" MAKE

POLYSAL

YOUR ROUTINE PRESCRIPTION

1. *Fox, C.L. Jr., et al. An Electrolyte Solution Approximating Plasma Concentrations with Increased Potassium for Routine Fluid and Electrolyte Replacement. J.A.M.A., March 8, 1952.*

CUTTER

CUTTER Laboratories.
BERKELEY, CALIFORNIA

FORMULA (per 100 cc.): Sodium Chloride, 0.496 gm.; Sodium Acetate N.F., 0.64 gm.; Potassium Chloride, 0.0746 gm.; Calcium Chloride, 0.0368 gm.; Magnesium Chloride, 0.0305 gm; Sodium Citrate, 0.0785 gm.